

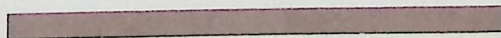
5255A

5255A FREQUENCY CONVERTER

OPERATING AND SERVICE MANUAL



HEWLETT  PACKARD



CERTIFICATION

The Hewlett-Packard Company certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from the factory. The Hewlett-Packard Company further certifies that its calibration measurements are traceable to the U.S. National Bureau of Standards to the extent allowed by the Bureau's calibration facility.

WARRANTY AND ASSISTANCE

All Hewlett-Packard products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. We will repair or replace products which prove to be defective during the warranty period. No other warranty is expressed or implied. We are not liable for consequential damages.

For any assistance contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.



OPERATING AND SERVICE MANUAL

MODEL 5255A FREQUENCY CONVERTER

SERIALS PREFIXED: 632-, 640-

This Operating and Service Manual applies to HP 5255A instruments with serial number prefix 632- and 640-.

SERIAL PREFIXES NOT LISTED

For new instruments with serial number prefixes above 640-, a "Manual Changes" sheet is supplied with this manual.

Copyright HEWLETT-PACKARD COMPANY 1967
1501 PAGE MILL ROAD, PALO ALTO, CALIFORNIA, U.S.A.

MANUAL CONTENT

This manual is supplied to help you make best use of your instrument. The manual covers 8 sections of information as follows:

Section I is an introduction to the instrument. Electrical and mechanical specifications are given, plus information on accessories.

Section II covers inspection, power, mounting, packing, shipping, and connection.

Section III outlines operating procedures.

Section IV discusses technical details of circuit operation.

Section V provides performance check, troubleshooting, and adjustment procedures.

Section VI lists replaceable parts.

Section VII gives information on manual changes.

Section VIII contains circuit diagrams with component location.

HOW TO ORDER

To order an Operating and Service Manual, contact your nearest Hewlett-Packard Sales and Service Office. Give complete model, name, and 8-digit serial number. The serial plate is on the rear panel (see Paragraph 1-9 for serial number system). Comments on this manual are welcome at any Sales and Service Office.

TABLE OF CONTENTS

| Section | | Page |
|---------|--|------|
| I | GENERAL INFORMATION | 1-1 |
| | 1-1. Description | 1-1 |
| | 1-7. Specifications | 1-1 |
| | 1-9. Instrument Identification | 1-1 |
| | 1-12. Cooling | 1-1 |
| II | INSTALLATION | 2-1 |
| | 2-1. Introduction | 2-1 |
| | 2-3. Unpacking and Inspection | 2-1 |
| | 2-5. Storage and Shipment | 2-1 |
| | 2-8. Installation | 2-1 |
| | 2-11. Power Requirements | 2-1 |
| | 2-13. Electrical Connections | 2-1 |
| III | OPERATION | 3-1 |
| | 3-1. Description | 3-1 |
| | 3-3. Controls and Inputs | 3-1 |
| | 3-10. Maximum Input Voltage | 3-1 |
| | 3-12. Frequency Measurement with Amplitude Less Than 100 MV RMS | 3-1 |
| | 3-14. Double Checking Frequency Measurement Results | 3-1 |
| IV | PRINCIPLES OF OPERATION | 4-1 |
| | 4-1. General | 4-1 |
| | 4-5. Phase Detector A1 | 4-1 |
| | 4-9. 10 MHz Oscillator A2 | 4-1 |
| | 4-11. 50 MHz Multiplier Amplifier A3 | 4-1 |
| | 4-13. 200 MHz Multiplier Amplifier A4 | 4-1 |
| | 4-15. Harmonic Generator A5 | 4-3 |
| | 4-17. Mixer-Cavity A6 | 4-3 |
| | 4-19. Video Amplifier A7 | 4-3 |
| | 4-23. Prescaler Assembly A8 | 4-3 |
| | 4-25. Control Circuit A9 | 4-3 |
| | 4-27. Gate Time Extender A10 | 4-4 |
| V | MAINTENANCE | 5-1 |
| | 5-1. Introduction | 5-1 |
| | 5-3. Test Equipment | 5-1 |
| | 5-9. Circuit Adjustments | 5-3 |
| | 5-10. Phase Detector A1 | 5-3 |
| | 5-12. 10 MHz Oscillator A2 | 5-3 |
| | 5-14. 50 MHz Multiplier/Amplifier A3 | 5-4 |
| | 5-16. 200 MHz Multiplier/Amplifier A4 | 5-4 |
| | 5-19. Harmonic Generator A5 | 5-5 |
| | 5-23. Control Board A9 | 5-5 |
| | 5-25. Troubleshooting | 5-8 |
| VI | REPLACEABLE PARTS | 6-1 |
| | 6-1. Introduction | 6-1 |
| | 6-4. Ordering Information | 6-1 |
| VII | MANUAL CHANGES | 7-1 |
| | 7-1. Manual Changes | 7-1 |
| | 7-2. Current Instruments | 7-1 |
| | 7-4. Older Instruments | 7-1 |
| | 7-6. Newer Instruments | 7-1 |
| VIII | CIRCUIT DIAGRAMS | 8-1 |
| | 8-1. Introduction | 8-1 |

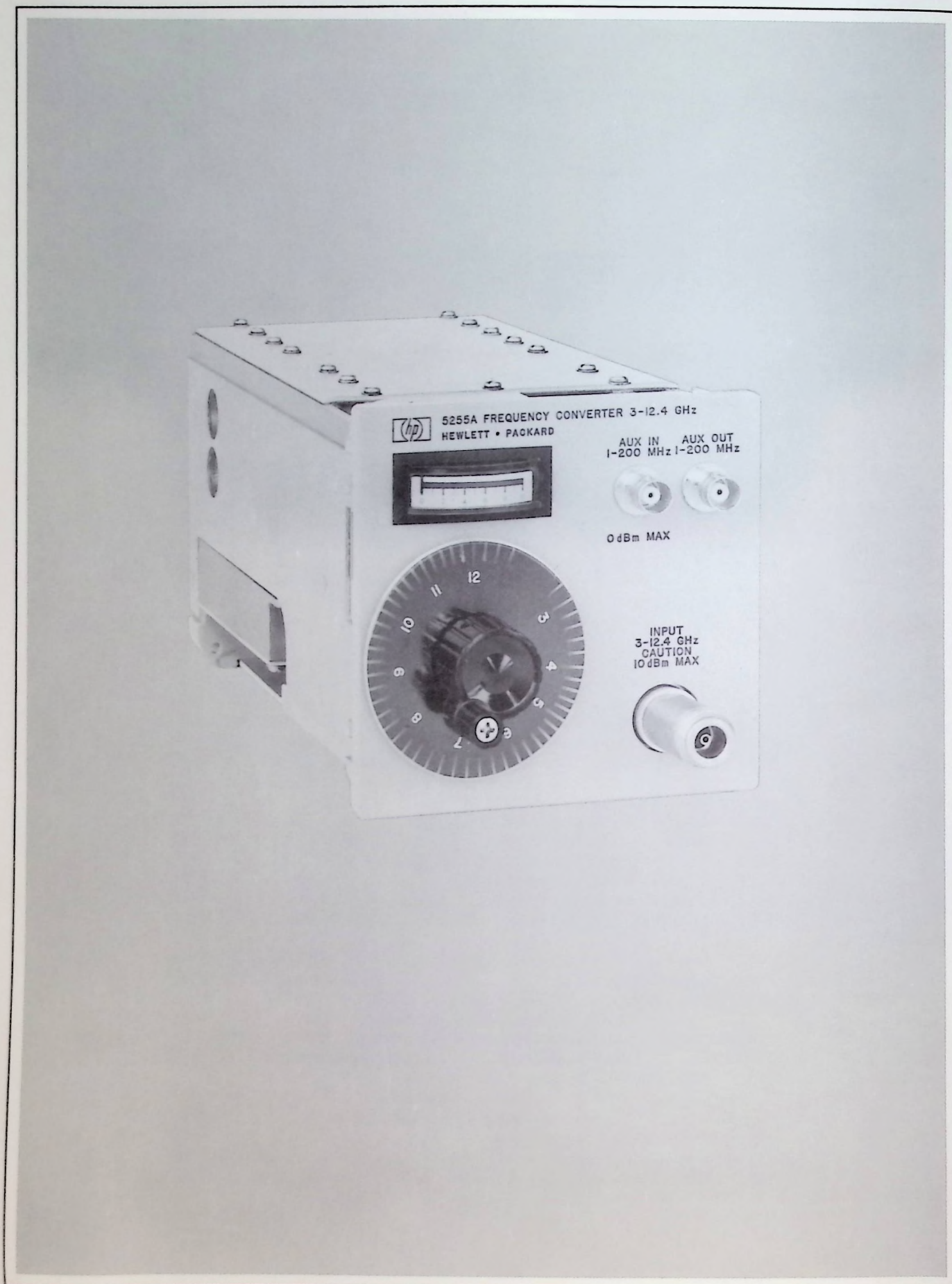
LIST OF TABLES

| Table | | Page |
|-------|--|------|
| 1-1. | Specifications | 1-1 |
| 3-1. | Typical Double-Check Frequency Measurement | 3-2 |
| 3-2. | Typical Frequency Measurements | 3-2 |
| 5-1. | Assembly Designations | 5-1 |
| 5-2. | Extender Boards | 5-1 |
| 5-3. | Recommended Test Equipment | 5-2 |
| 5-4. | Troubleshooting Procedure | 5-9 |
| 5-5. | In-Cabinet Performance Check | 5-10 |
| 6-1. | Reference Designation Index | 6-2 |
| 6-2. | Replaceable Parts | 6-18 |
| 6-3. | Code List of Manufacturers | 6-24 |

LIST OF ILLUSTRATIONS

| Figure | | Page |
|--------|---|------|
| 1-1. | Model 5255A Frequency Converter Plug-In | 1-0 |
| 3-1. | Model 5255A Operating Procedure | 3-0 |
| 4-1. | Functional Block Diagram | 4-2 |
| 5-1. | Type 1 Extender Board | 5-1 |
| 5-2. | Type 2 Extender Board | 5-3 |
| 5-3. | Phase Detector Test Setup | 5-3 |
| 5-4. | 10 MHz Oscillator Test Setup | 5-3 |
| 5-5. | 50 MHz Multiplier/Amplifier Test Setup | 5-4 |
| 5-6. | 200 MHz Multiplier/Amplifier Test Setup | 5-4 |
| 5-7. | Harmonic Generator Test Setup | 5-5 |
| 5-8. | Control Assembly Test Setup | 5-5 |
| 5-9. | Mixer and Cavity Parts | 5-6 |
| 5-10. | Tuning Cavity Mechanical Parts | 5-7 |
| 5-11. | Troubleshooting Block Diagram | 5-8 |
| 5-12. | Frequency Range Check | 5-10 |
| 5-13. | Measurement Accuracy Check | 5-11 |
| 8-1. | General Notes for Schematic Diagrams | 8-2 |
| 8-2. | Block Diagram | 8-3 |
| 8-3. | Phase Detector Assembly A1 10 MHz Oscillator Assembly A2 | 8-5 |
| 8-4. | 50 MHz Multiplier/Amplifier Assembly A3 200 MHz Multiplier/Amplifier Assembly A4 | 8-7 |
| 8-5. | Harmonic Generator Assembly A5 Mixer-Cavity Assembly A6 Video Amplifier Assembly A7 | 8-9 |
| 8-6. | Prescaler Assembly A8 | 8-13 |
| 8-7. | Control Circuit Assembly A9 | 8-15 |
| 8-8. | Gate Time Extender Assembly A10 | 8-17 |

Figure 1-1. Model 5255A Frequency Converter Plug-In



SECTION I

GENERAL INFORMATION

1-1. DESCRIPTION.

1-2. The Hewlett-Packard Model 5255A Frequency Converter is a plug-in unit which extends the frequency measuring capability of 50 MHz Electronic Counters from 3 to 12.4 GHz (300 Mc to 12400 Mc). It can be used for measurements from 2.6 GHz to 12.6 GHz; see Section III. Refer to appropriate counter manual for complete operation instructions.

1-3. The stability and accuracy of the basic counter are retained by multiplying a 10 MHz signal, derived from the 1 MHz internal time base of the counter, to 200 MHz and selecting a harmonic frequency between 2.8 and 12.4 GHz. This known harmonic of 200 MHz is then heterodyned with the INPUT signal. The resulting difference frequency, if between 1 MHz and 212 MHz (bandwidth of amplifier in plug-in) is counted and displayed by the counter. The frequency of the INPUT signal is then indicated by the combination of the MIXING FREQUENCY control (in gigahertz; front panel of plug-in) and the digital display of the counter (in megahertz). Because of a prescaling factor of 4 in the converter, the counter gate times are automatically extended by a factor of 4 for a direct readout.

1-4. The AUX IN jack may be used with 5 mV to 225 mV and 1 to 200 MHz input signals. The signal will be prescaled by 4 and counted by the counter. This extends the direct reading frequency range of the counter to 200 MHz and increases the sensitivity of the counter to 5 mV for 1 to 200 MHz inputs.

1-5. The AUX OUT jack output comes from the video amplifier output and is the amplified difference frequency between the input signal and the selected mixing frequency.

1-6. A front panel meter, by monitoring the difference frequency output of the plug-in to the counter,

aids in selecting the desired MIXING FREQUENCY and also in determining if INPUT signal amplitude is adequate for accurate frequency measurement.

1-7. SPECIFICATIONS.

1-8. Table 1-1 contains all technical specifications for the Model 5255A when operated in HP Electronic Counters.

1-9. INSTRUMENT IDENTIFICATION.

1-10. Each Model 5255A is identified by a two-section, eight digit (000-00000) serial number on the rear of the plug-in. The five-digit number is an identification number unique to each instrument, and the three digit number is a serial prefix number used to document changes.

1-11. All instruments with the same serial prefix are the same. The group of instruments to which this manual applies directly is identified on the title page. For older instruments (lower serial numbers), make manual changes listed in Section VII. For newer instruments, having serial numbers higher than those listed on the title page, a Manual Change sheet is included, describing the required changes. The manual for an instrument having special electrical modification will include an insert sheet describing that modification. If a change sheet or special information sheet is missing, the information can be supplied by any Hewlett-Packard sales and service office listed at the back of this manual.

1-12. COOLING.

1-13. The Model 5255A is cooled by the ventilation system of the counter in which it is installed. See counter service manual for cooling system maintenance instructions.

Table 1-1. Specifications *

RANGE: As a converter for HP Electronic Counters, 3 to 12.4 GHz using mixing frequencies of 2.8 to 12.4 GHz in 200 MHz steps. As a prescaler, 1 MHz to 200 MHz.

ACCURACY: Retains counter accuracy.

INPUT SENSITIVITY: 100 mV rms (-7 dBm) as a converter. 5 mV rms as a prescaler.

INPUT IMPEDANCE: 50 ohms nominal.

MAXIMUM INPUT: +10 dBm; 0 dBm on AUX IN.

LEVEL INDICATOR: Meter aids frequency selection; indicates usable signal level.

AUXILIARY OUTPUT: 1 MHz to 200 MHz difference signal from video amplifier.

REGISTRATION: Counter display in MHz is added to converter dial reading.

INSTALLATION: Plugs into front panel plug-in compartment of HP 5245L or 5246L Electronic Counters.

INPUT CONNECTOR: Precision Type N female. GPC-7 connector optional.

WEIGHT: Net, 8-1/4 lbs. (3,8 kg).
Shipping, 12 lbs. (5,5 kg).

* When used with HP 50 MHz Electronic Counters; Model 5245L prefixed 402 and above or Model 5246L.

SECTION II

INSTALLATION

2-1. INTRODUCTION.

2-2. This section contains information on unpacking, inspection, repacking, storage, and installation.

2-3. UNPACKING AND INSPECTION.

2-4. If the shipping carton is damaged, ask that the carrier's agent be present when the instrument is unpacked. Inspect the instrument for damage (scratches, dents, broken knobs, etc). If the instrument is damaged or fails to meet specification (Performance Check, Table 5-5), notify the carrier and the nearest Hewlett-Packard sales and service office immediately (sales and service offices are listed at the back of this manual). Retain the shipping carton and the padding material for the carrier's inspection. The sales and service office will arrange for the repair or replacement of your instrument without waiting for the claim against the carrier to be settled.

2-5. STORAGE AND SHIPMENT.

2-6. **PACKAGING.** To protect your instrument during shipment or storage, use the best packaging methods available. Your Hewlett-Packard sales and service office can provide materials similar to those used for original factory packaging. Contract packaging companies can provide dependable custom packaging on short notice.

a. If possible, use the original container designed for the instrument. Otherwise, use a strong carton (350 lb/sq inch bursting strength) or wooden box to house the instrument.

b. Wrap the instrument in heavy paper or plastic before placing it in the shipping container.

c. Use plenty of packing material around all sides of the instrument and protect the front panel with cardboard strips.

d. Seal the package with strong tape or metal bands. Mark with "Delicate Instrument".

e. Refer to the address list at the rear of this manual and check with your Hewlett-Packard sales

and service office for shipping instructions. All correspondence should refer to an instrument by Model number and the full eight-digit serial number.

2-7. **ENVIRONMENT.** Conditions during storage and shipment should normally be limited as follows:

a. Maximum temperature 167°F (75°C).

b. Minimum temperature -40°F (-40°C).

CAUTION

TURN COUNTER POWER OFF BEFORE INSTALLING OR REMOVING FREQUENCY CONVERTER.

2-8. INSTALLATION.

2-9. The Model 5255A plugs into the rectangular compartment at the right-hand side of the front panel of the Electronic Counter. To install unit in counter, first check that retaining latch is turned fully counterclockwise, then push unit firmly into compartment until front panel of plug-in is flush with front panel of counter. Then turn retaining latch clockwise until it is tight.

2-10. To remove unit from counter, turn retaining latch counterclockwise to its stop. Then grasp mixing frequency selector and firmly pull unit from counter. If any difficulty is encountered with installation or removal, check that retaining latch is fully counterclockwise.

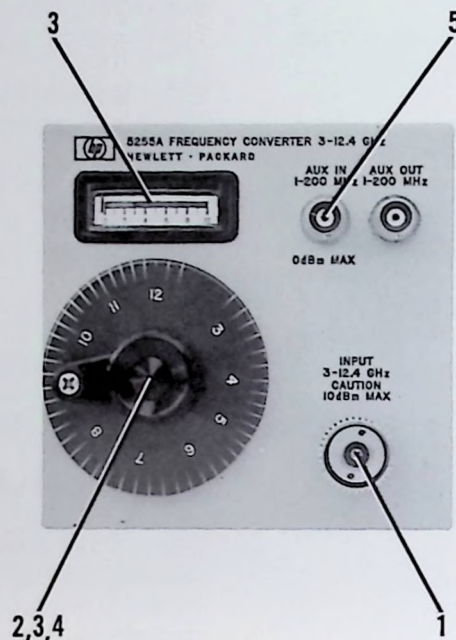
2-11. POWER REQUIREMENTS.

2-12. All electrical power required to operate the Model 5255A is supplied by the counter in which the unit is installed.

2-13. ELECTRICAL CONNECTIONS.

2-14. The INPUT, AUX IN, and AUX OUT connectors on front panel of plug-in (see Figure 3-1) are the only external electrical connections to the unit. All other connections are made through the 50-pin connector at the rear of plug-in when installed in counter.

Figure 3-1. Model 5255A Operating Procedure



FREQUENCY MEASUREMENTS

See appropriate counter operating manual for complete operating instructions.

1. Connect input signal to INPUT of converter.
2. Set Mixing Frequency control to read slightly less than 2.8 GHz.
3. Slowly turn Mixing Frequency control counter-clockwise to obtain the first response, and tune for a maximum reading in the green portion of the Level Indicator Meter scale.
4. Add counter display (in kHz) to Mixing Frequency control reading (in GHz) for frequency of INPUT signal.

USE OF AUX IN

5. To use prescaler portion of plug-in connect the 1 to 200 MHz input signal to the AUX IN jack (0 dBm max).
6. The counter will display frequency of input signal. (During this measurement the main input to the converter should be disconnected, or, if a microwave signal is present at the main input, the converter should be detuned so that there is no counter reading from that source.)

SECTION III

OPERATION

3-1. DESCRIPTION.

3-2. The Model 5255A Frequency Converter increases the range of the 50 MHz Electronic Counter to 3 through 12.4 GHz (3000 to 12,400 MHz). As a general rule to measure frequency, always start with the Mixing Frequency Control below 3 GHz and tune upward in frequency to obtain first response and tune for a maximum reading in the green portion of the meter scale. This procedure will be valid whether there are responses in 1, 2, or 3 consecutive harmonic reference frequencies; see Table 3-2. If the input signal level to the converter is high, the second, third, and other harmonics of this signal may be generated. Therefore, tuning Mixing Frequency Control from the low end upward will enable the input fundamental frequency to be detected before its harmonics. In the 5255A harmonics of the reference-frequency signals are held to such a low level that regardless of input signal level, their mixing effects are not observable, avoiding possible ambiguity. Figure 3-1 provides a step-by-step procedure to be used for measurement of frequencies from 3 to 12.4 GHz (3000 to 12,400 MHz). The only exception is if the first response occurs at 2.8 GHz or 3.0 GHz. To avoid possible ambiguity in these cases, start from above 3.4 GHz and tune downward in frequency for the first response and subtract the counter reading from the dial frequency for the frequency of the input signal.

3-3. CONTROLS AND INPUTS.

3-4. GENERAL. The function of the front panel tuning control, input connector, meter, AUX input, and AUX output connectors are described in Paragraphs 3-5 through 3-9.

3-5. INPUT CONNECTOR. Signal input, 50 ohms input impedance, 100 mV (-7 dBm) to 707 mV (+10 dBm) into precision type "N" female connector (APC-7 or "N" type male connectors are optional).

3-6. MIXING FREQUENCY SELECTOR. Calibrated from 2.8 GHz to 12.4 GHz (2800 MHz to 12,400 MHz), this control tunes the internal cavity to select a harmonic of 200 MHz to be mixed with the INPUT signal.

3-7. LEVEL INDICATOR METER. The meter circuit continuously monitors the level of the difference frequency output of the converter to the counter. When meter reads in the green portion of its scale,

INPUT signal amplitude is adequate for accurate frequency measurement.

3-8. AUX IN. Signals connected to this input of 5 mV (-33 dBm) up to 224 mV (0 dBm) and 1 to 200 MHz at the AUX IN jack will be counted and displayed directly.

3-9. AUX OUT. The output from the AUX OUT jack is the 1 to 200 MHz difference signal from the video amplifier.

Note

If any difficulty occurs while making measurements, check all cables and connectors for resonant points.

3-10. MAXIMUM INPUT VOLTAGE.

3-11. Damage to the converter may result if an AC signal greater than .707 V rms (+10 dBm) or a DC voltage greater than 5 V is applied to converter INPUT connector.

3-12. FREQUENCY MEASUREMENT WITH AMPLITUDE LESS THAN 100 MV RMS.

3-13. The front panel level indicator meter indicates in the green portion of its scale only when converter is properly tuned and amplitude of INPUT signal is adequate for accurate frequency measurement. (Because of conservative specifications of the converter this will usually occur with an input signal less than 100 mv.)

3-14. DOUBLE CHECKING FREQUENCY MEASUREMENT RESULTS.

3-15. Because of the heterodyne action of the converter, frequency measurement results obtained at any one setting of the Mixing Frequency Control may be checked at other settings. In most cases these will be consecutive responses: tune in the first response and add the counter display to dial frequency reading; then tune up in frequency to the second response and subtract the counter display from the dial frequency reading (see Table 3-1). In some cases there will be three consecutive responses (see Table 3-2); in these cases the third response will be the one in which you subtract the counter display from the dial frequency reading.

Table 3-1. Typical Double-Check Frequency Measurement

| Input Frequency | Counter Reading | Mixing Frequency | Meter Indication | Response |
|-----------------|-----------------|------------------|------------------|---|
| 8.1234567 GHz | .1234567 GHz | 8.0 GHz | Peak | First Response: 8.0000000 GHz + .1234567 GHz 8.1234567 GHz |
| | .0765433 | 8.2 GHz | Peak | Second Response: 8.2000000 GHz - .0765433 GHz 8.1234567 GHz |

Table 3-2. Typical Frequency Measurements

| Input Frequency | Display | Meter | Dial | Response |
|--|----------------------------|-------|----------|--|
| 2600 MHz | EXAMPLE OF ONE RESPONSE | | | |
| | 000000.00 MHz | Red | 3.0 GHz | No response; frequency difference greater than passband of video amplifier |
| | 000200.00 MHz | Green | 2.8 GHz | First Response: * 2800 MHz - 200 MHz 2600 MHz |
| | 000000.00 MHz | Red | 12.2 GHz | No response; frequency difference greater than passband of video amplifier |
| 12,600 MHz | 000200.00 MHz | Green | 12.4 GHz | First Response: 12,400 MHz + 200 MHz 12,600 MHz |
| | EXAMPLE OF TWO RESPONSES | | | |
| | 000050.00 MHz | Green | 10.0 GHz | First Response: 10,000 MHz + 50 MHz 10,050 MHz |
| | 000150.00 MHz | Green | 10.2 GHz | Second Response: 10,200 MHz - 150 MHz 10,050 MHz |
| 4000 MHz | 000200.00 MHz | Green | 3.8 GHz | First Response: 3800 MHz + 200 MHz 4000 MHz |
| | 000000.00 MHz | Red | 4.0 GHz | No response; difference frequency less than passband of video amplifier |
| | 000200.00 MHz | Green | 4.2 GHz | Second Response: 4200 MHz - 200 MHz 4000 MHz |
| | EXAMPLE OF THREE RESPONSES | | | |
| 11,005 MHz | 000205.00 MHz | Green | 10.8 GHz | First Response: 10,800 MHz + 205 MHz 11,005 MHz |
| | 000005.00 MHz | Green | 11.0 GHz | Second Response: 11,000 MHz + 5 MHz 11,005 MHz |
| | 000195.00 MHz | Green | 11.2 GHz | Third Response: 11,200 MHz - 195 MHz 11,005 MHz |
| *When response present at 2.8 or 3.0 GHz, tune from above and subtract first reading, (See Paragraph 3-2). | | | | |

SECTION IV

PRINCIPLES OF OPERATION

4-1. GENERAL.

4-2. The Model 5255A is a heterodyne frequency converter designed to extend the range of frequency measurement of the Electronic Counters to 2.8 GHz through 12.4 GHz (2800 MHz through 12,400 MHz).

4-3. The Converter contains ten basic functional sections: phase detector, 10 MHz oscillator, 50 MHz multiplier-amplifier, 200 MHz multiplier-amplifier, harmonic generator, mixer-cavity, video amplifier, prescaler, control circuit, and gate time extender. (See Figure 4-1, and for circuit details refer to the schematic diagrams Figures 8-2 through 8-8.)

4-4. In normal operation the harmonic generator produces all of the harmonics of 200 MHz between 2.8 MHz and 12.4 MHz. The harmonic selector cavity is tuned to select one of these harmonics to be supplied through the low-pass filter to the mixer. The mixer output is the difference frequency produced by mixing of the input frequency and the frequency supplied by the harmonic selector cavity. This difference frequency is amplified by the video amplifier and supplied to the counter input circuit. A low-pass filter within the video amplifier prevents difference frequency signals above 212 MHz from reaching the counter input circuit. The output of the video amplifier is monitored by a control circuit which indicates when difference frequency output amplitude is greater than the minimum signal required by the counter input circuit.

Note

In the following discussion complete reference designations are used to identify components. This is to prevent confusion between reference designations of components located on the chassis and components located on an assembly. For example, "R1" would refer to a component located on the chassis, while "A1R1" would refer to a component located on the phase detector assembly A1 (see Table 5-1 for assembly designations).

4-5. PHASE DETECTOR A1.

4-6. The Phase Detector holds the 10 MHz generated by the voltage tuned oscillator on assembly A2 in phase lock with the 10 MHz signal from the counter. This creates a phase locked loop which acts as a narrow band filter at 10 MHz. The two 10 MHz signals are added by A1Q2 and A1Q3 then detected by A1CR4 and A1CR5. The detected signal is the phase control signal and passes through an emitter follower, A1Q5, before being sent to assembly A2.

4-7. If the reference 10 MHz should not be present (if for example the counter should be switched to EXT

STD with no external standard present) a "no lock" signal is generated. Limiter A1Q1 turns off when there is no 10 MHz signal at its base. That in turn switches on the "on" gate A1Q7 and A1Q8 generating a "no lock" signal. A no lock signal will also be generated if the 10 MHz from the counter pulls out of phase lock with the 10 MHz generated by the oscillator on assembly A2. Should this occur the phase control signal would be a beat note. This beat note is detected by A1CR6 and A1CR7. The detected signal passes through an emitter follower and switches on the "on" gate to produce the no lock signal. The no lock signal is sent to the control board where it is used to inhibit counting.

4-8. The test signal at pin 5 of A1 is available at the AUX B output of the counter. If the phase detector is operating normally there will be 0 volts dc at the test point. "No Lock" condition will be shown by +13 volts. The test signal is AC coupled to the phase control signal so that if a beat note is present it can also be seen at AUX B superimposed upon the out-of-lock dc signal. (Note: Except for the special case of a disconnected external reference to the counter, in normal operation a "no lock" signal will not occur.) Such a signal indicates failure of the counter reference signal or failure within the converter. The "no lock" signal prevents erroneous readings in the event of such a failure.

4-9. 10 MHz OSCILLATOR A2.

4-10. The oscillator assembly consists of an active low pass filter and a voltage tuneable crystal oscillator. The oscillator is held at exactly the same frequency as the 10 MHz counter reference signal by the phase control signal from A1. This signal first passes through the low pass filter then is applied to varactors A2CR1 and A2CR2, which tunes the oscillator to hold phase lock. Output from the oscillator goes to both the phase detector, for comparison with the 10 MHz reference, and to the 50 MHz multiplier-amplifier A3.

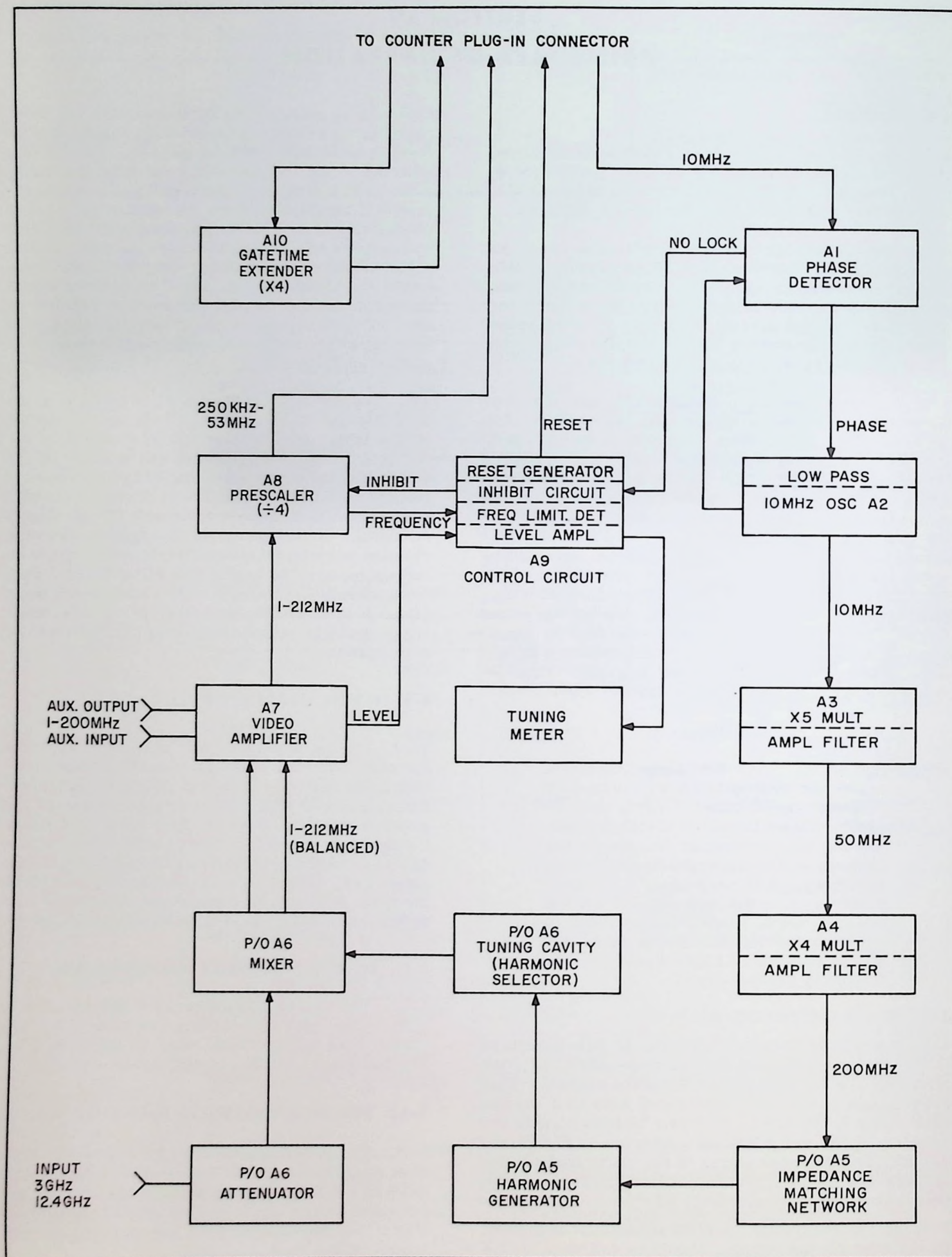
4-11. 50 MHz MULTIPLIER AMPLIFIER A3.

4-12. The 10 MHz output from A2 is multiplied to 50 MHz in the first stage A3Q1. The rest of A3 is a narrow-band synchronously tuned 50 MHz amplifier. The last stage of A3 is a partial limiter as well.

4-13. 200 MHz MULTIPLIER AMPLIFIER A4.

4-14. The 50 MHz signal from A3 is doubled in the first stage of A4 to 100 MHz then doubled again in A4Q2 to 200 MHz. The remaining stages furnish narrow-band (synchronously tuned) amplification at 200 MHz. The output level from the last stage is controlled by R12.

Figure 4-1. Functional Block Diagram



4-15. HARMONIC GENERATOR A5.

4-16. The 200 MHz signal from the multiplier amplifier A4 passes through the matching network to drive the step recovery diode A5CR1. A5CR1 generates harmonic energy which it couples into the resonate tuning cavity. The dc voltage generated by A5CR1 is available at the test point on A5 (see Figure 8-5).

4-17. MIXER-CAVITY A6.

4-18. The input signal from J1 passes through the attenuator to the mixing diodes. The signal from the tuning cavity is also coupled to the mixing diodes. The two signals are mixed and the difference frequency is the signal to the video amplifier A7.

4-19. VIDEO AMPLIFIER A7.

4-20. The video amplifier assembly is a wideband feedback stagger-tuned amplifier with a voltage gain of 50 dB into 50 ohms.

4-21. The two signals from the balanced mixer in A6 is applied to the base of A7Q2 through A7T1. A7Q2, A7Q4, A7Q6, A7Q8, and A7Q10 amplify the input signal. A7Q1 is used to bias A7Q2 and A7Q3, A7Q5, A7Q7, and A7Q9 perform the same function in relation to the signal path transistors A7Q4, A7Q6, A7Q8, and A7Q10 respectively. The output from A7Q10 drives the prescaler A8 and is applied to the base of A7Q11 and A7Q12. A7Q12 is another amplifier whose output is detected by A7Q13 and A7Q14. The detector provides a dc current which is proportional to the magnitude of the input signal. Diodes A7CR5 and A7CR6 provide temperature stability to the detector circuit. The voltage at the collector of A7Q13 is the amplitude level signal which drives the tuning meter section of the control circuit A9. The voltage level at the collector of A7Q14 controls the operation of the AGC circuit which prevents distortion from high level input signals. When the amplified input signal is sufficiently large and the collector voltage of A7Q14 decreases to less than 3 V, both A7Q15 and A7Q16 are turned on. When A7Q15 draws current, A7CR1, A7CR2, and A7CR4 are all forward biased. A7CR1 and A7CR2 shunt part of the signal coming from AUX IN and A7CR4 provides shunting in the 3rd stage of amplification.

4-22. The signal from AUX IN jack J2 is resistively isolated from the main input. It has a 50 ohm input impedance and a sensitivity 12 dB lower than the main input. AUX OUT is isolated from the main output by A7R1 and A7Q11. The voltage gain between AUX OUT and AUX IN is 25 dB into 50 ohms.

4-23. PRESCALER ASSEMBLY A8.

4-24. The prescaler input is a 1 to 212 MHz signal from the video amplifier A7. This signal is amplified by input amplifier A8Q2. The output of A8Q2 fires

tunnel diode trigger A8CR1. The square wave from the trigger is amplified by A8Q1 and differentiated by A8R3, A8L3. The differentiated signal is amplified and the negative pulses clipped by driver amplifier A8Q4. The output from A8Q4 drives binary A. The output of binary A goes through buffer amplifier A8Q9. The output of A8Q9 is differentiated by A8R21, A8L6, and amplified and clipped by A8Q10. The output of A8Q10 drives binary B. Binary B outputs go through buffer amplifiers A8Q14 and A8Q15 to output amplifiers A8Q16 and A8Q17. A8Q16 output goes to the AUX A jack on the rear of the counter and A8Q17 output is the signal input to the counter.

4-25. CONTROL CIRCUIT A9.

4-26. The Control Circuit Assembly performs the following functions:

a. It drives the tuning meter with a current proportional to the amplitude level signal from the video amplifier. The level signal from the video amplifier passes through emitter follower A9Q6 before being sent to the meter.

b. It inhibits the prescaler if a no lock signal from the phase detector is present or if the input level signal is smaller than that required to move the tuning needle above approximately 3 on the tuning meter scale. A "no lock" signal from the phase detector saturates A9Q7 which inhibits the prescaler. A9Q8 is saturated and also inhibits the prescaler if the (level signal) voltage on the base of A9Q9 is lower than the reference voltage on the base of A9Q10.

c. The control board generates a pulse to reset the counter when the level signal moves the tuning meter up or down past 3 on the tuning meter. A9Q11 is held off by A9CR4 or A9CR5 except when A9Q9 and A9Q10 are both conducting, that is when the amplitude level passes through the inhibit threshold. When A9Q11 conducts it turns on A9Q12. The signal from A9Q12 is differentiated by A9R26 and A9C9 and the pulse thus generated is amplified by A9Q13 to drive the reset line in the counter.

d. The control board clamps the input level signal so that the tuning meter goes to zero if the signal into the "frequency" input from the prescaler is greater than approximately 212 MHz. The "frequency" signal from the prescaler is sent through a high pass filter (A9C1 and A9L1) and a low pass filter (A9C4 and A9L2) and is detected by A9CR1 and A9CR2. Below 212 MHz A9CR2 will detect a larger voltage than A9CR1 and A9Q2 will conduct more than A9Q1. Above 212 MHz A9CR1 will detect a larger signal than A9CR2, and A9Q1 will conduct more than A9Q2. A9Q3 and A9Q4 amplify the difference further and A9Q3 also drives transistor A9Q5 to saturation for "frequency" inputs above 212 MHz. When A9Q5 saturates the meter reading drops to zero. A dc bias adjusted by A9R4 holds A9Q5 out of saturation when there is no "frequency" input signal.

4-27. GATE TIME EXTENDER A10.

4-28. The gate time extender assembly delays the gate trigger signal to the counter gate control by delaying the stop signal to the main counter gate. This is done by multiplying the period of the gate triggering signal from the counter by a factor of 4. The result is a direct readout of the measured frequency.

4-29. The reset pulse from the counter sets the binaries so A10Q5 and A10Q7 are conducting. The first pulse turns off A10Q5 and turns on A10Q4. The output of A10Q4 turns off A10Q7 and turns on A10Q6. The

output of A10Q6 triggers the gate flip-flop A10Q9, A10Q10. The output of the gate flip-flop is amplified by the start amplifier A10Q8 and opens the main gate of the counter. The second pulse turns off A10Q4 and turns on A10Q5. The third pulse turns A10Q5 off and A10Q4 on. The output of A10Q4 turns A10Q6 off and A10Q7 on. The fourth pulse turns A10Q4 off and A10Q5 on. The fifth pulse turns A10Q5 off and A10Q4 on. The output of A10Q4 turns A10Q7 off and A10Q6 on. The output of A10Q6 triggers the gate flip-flop. The output of the gate flip-flop is amplified by the stop amplifier A10Q12 and closes the main gate of the counter. Five pulses have been counted to measure four periods of the gate triggering signal.

SECTION V MAINTENANCE

5-1. INTRODUCTION.

5-2. The maintenance section includes a table of assembly designations and a table of recommended test equipment. Special equipment is covered in Paragraphs 5-3 through 5-8. An in-cabinet performance check and test card are also provided to be used: a) as part of an incoming inspection check of instrument specifications; b) periodically, for instruments used in systems where maximum reliability is required; c) as part of a troubleshooting procedure, and d) after repairs or adjustments, before returning instrument to regular service. Circuit adjustments are covered in Paragraphs 5-9 through 5-24. A troubleshooting procedure is given in Paragraph 5-25. Exploded views of the tuning cavity and harmonic generator assembly are shown in Figures 5-9 and 5-10.

Table 5-1. Assembly Designations

| | |
|-----|------------------------------|
| A1 | PHASE DETECTOR |
| A2 | 10 MHz OSCILLATOR |
| A3 | 50 MHz MULTIPLIER/AMPLIFIER |
| A4 | 200 MHz MULTIPLIER/AMPLIFIER |
| A5 | HARMONIC GENERATOR |
| A6 | MIXER-CAVITY |
| A7 | VIDEO AMPLIFIER |
| A8 | PRESCALER |
| A9 | CONTROL CIRCUIT |
| A10 | GATE TIME EXTENDER |

5-3. TEST EQUIPMENT.

5-4. GENERAL. Recommended test equipment is listed in Table 5-3. Three special extender boards are required. They are described in Paragraphs 5-5 through 5-8.

5-5. SPECIAL EXTENDER BOARDS. Three modified extender boards are needed to perform the adjustment procedures on assemblies A1, A2, A3, and A4. Construction of the three boards is described in the following paragraphs. Table 5-2 lists the type of modified extender board needed for each assembly.

Table 5-2. Extender Boards

| ASSEMBLY | EXTENDER BOARD |
|-----------------------|-------------------|
| A2 10 MHz Oscillator | Type 1 |
| A3 50 MHz Mult./Amp. | Type 2 |
| A4 200 MHz Mult./Amp. | Type 3 |
| A9 Control Circuit | Standard Extender |

5-6. TYPE 1 EXTENDER BOARD. This board consists of a standard extender board with a "BNC" connector mounted as shown in Figure 5-1. Contact pin S has been bent away from the board. A wire goes from pin S to the "BNC" center contact and then to contacts S and R. A 10Kohm pot is connected between pin L and ground. The center contact is connected to pin N.

NOTE

The sections of conductor that have been removed are from conductors N, R, and S.

Figure 5-1. Type 1 Extender Board

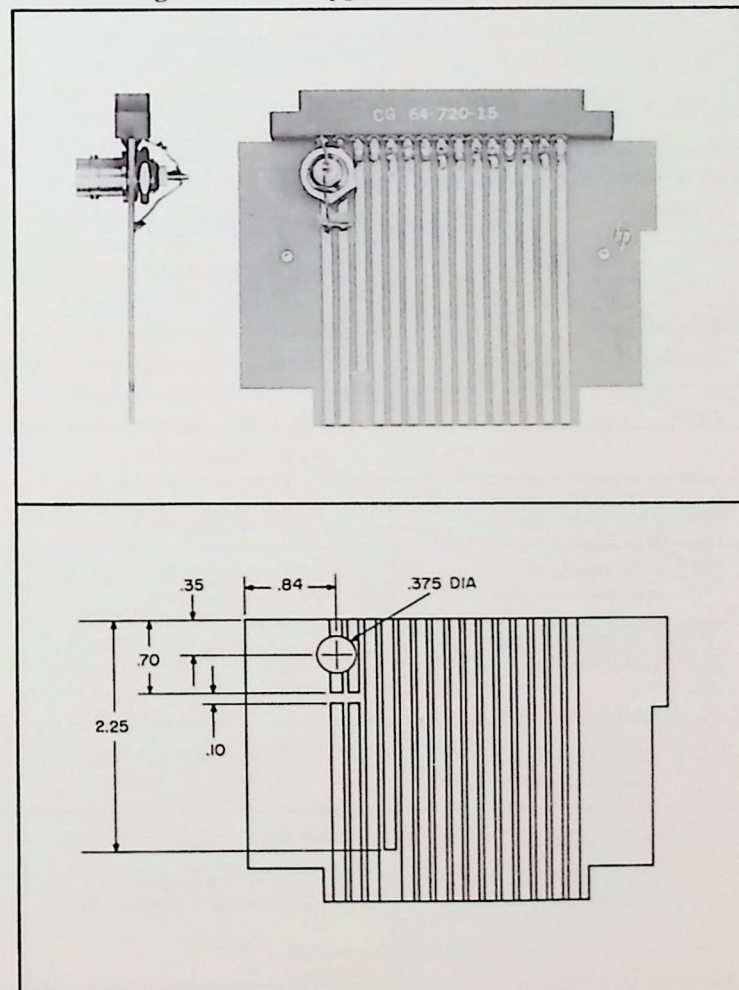


Table 5-3. Recommended Test Equipment

| INSTRUMENT | CHARACTERISTICS | RECOMMENDED TYPE |
|--------------------------------|--|---|
| Electronic Counter | Range: 50 MHz Sensitivity: 100 mV | HP Model 5245L |
| Sweep Oscillator | Range: 3.0 to 12.4 GHz Output: -7 dBm leveled | HP Model 8690 with 8692B/8693B/8694B |
| Test Oscillator | Range: 1 MHz to 10 MHz Output: 5 mV | HP Model 651B |
| VHF Oscillator | Range: 10 MHz to 201 MHz Output: 5 mV | HP Model 3200B |
| Quartz Oscillator | Range: 1 MHz and 5 MHz sine wave Accuracy: $\pm 5 \times 10^{-10}/24$ hours | HP Model 107BR |
| Power Meter | Range: 3.0 GHz to 12.4 GHz | HP Model 431C |
| Thermistor Mounts | Range: 3 GHz to 12.4 GHz Power Range: 1 μ W to 10 mW Max SWR: 1.5:1 | HP Models S486A/ G486A/J486A/X486A |
| Frequency Synthesizer | Range: 0.8 GHz to 12.4 GHz Power Input: 1 dBm | HP Model 2654A |
| Signal Generator | Range: 10 GHz to 12 GHz Output: +3 dBm | HP Model 626A |
| Waveguide Directional Couplers | Coupling Factor: 10 dBm | HP Models S752C/ G752C/J752C/X752C |
| Waveguide to Coax Adapters | Max SWR: 1.25:1 | HP Models S281A/ G281A/J281A/X281A |
| Coax Attenuator | Attenuation Range: 0 to 80 dB in 10 dB steps | HP Model 355D |
| Coax Attenuator | Attenuation Range: 0 to 12 dB in 1 dB steps | HP Model 355C |
| Coax Directional Coupler | Frequency Range: 215 to 450 MHz Attenuation: 20 dB | HP Model 774D |
| Crystal Detector | Frequency Range: 10 MHz to 12.4 GHz | HP Model 423A |
| Oscilloscope | 50 MHz Bandwidth, dual trace plug-in, external sync capability | HP Model 175A with HP 1750B & 1780A |
| Power Supply | +13V and -15V, 500 ma | HP Model 6205B |
| DC Voltmeter | 0 V to ± 50 V, 10 megohm input impedance 1% accuracy | HP Model 412A |
| RF Millivoltmeter | Voltage Range: 10 mV to 10 V rms Frequency Range: 500 kHz to 1 GHz | HP Model 411A |
| 50 ohm Coax Termination | SWR: less than 1.05:1 | HP Model 908A |
| Extender Cable | 50 pin | HP Model 10506B |
| Extender Board | 15 pin (4 required) | HP Part No. 05245-6022 |

5-7. **TYPE 2 EXTENDER BOARD.** This board consists of a standard extender board with a "BNC" connector mounted as shown in Figure 5-2. Contact pin A has been bent away from the board. A wire is connected from pin A to the "BNC" center contact.

5-8. **TYPE 3 EXTENDER BOARD.** This board consists of a standard extender board with a 510 ohm resistor added to it. Pin A is bent away from the board. The 510 ohm resistor is connected between pin A and conductor A on the board.

NOTE

All tests are with ϕ Model 5255A connected to ϕ Model 5245L Electronic Counter.

5-9. CIRCUIT ADJUSTMENTS.

5-10. PHASE DETECTOR A1.

5-11. The following procedure adjusts the phase detector assembly A1 for maximum output.

a. Set up equipment as shown in Figure 5-3.

b. Set oscilloscope controls as follows:

| | |
|--------------------------------|------------|
| VERTICAL INPUT | DC |
| VERTICAL SENSITIVITY | 5 V/cm |
| TIME BASE | .5 msec/cm |
| TRIGGERING | INT |

Figure 5-2. Type 2 Extender Board

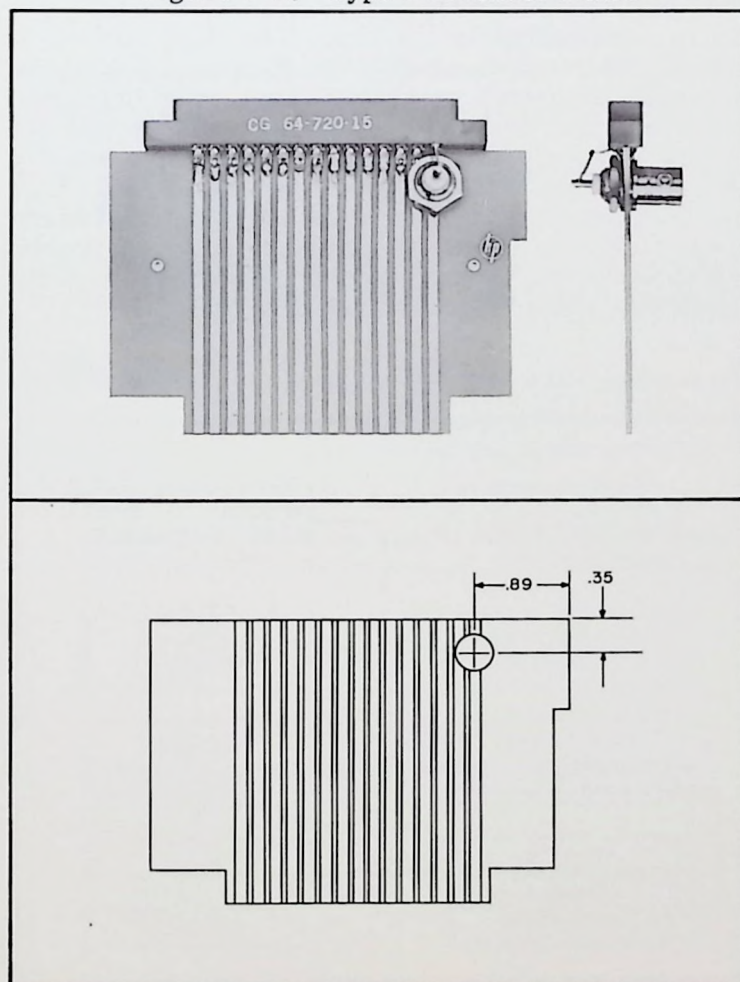
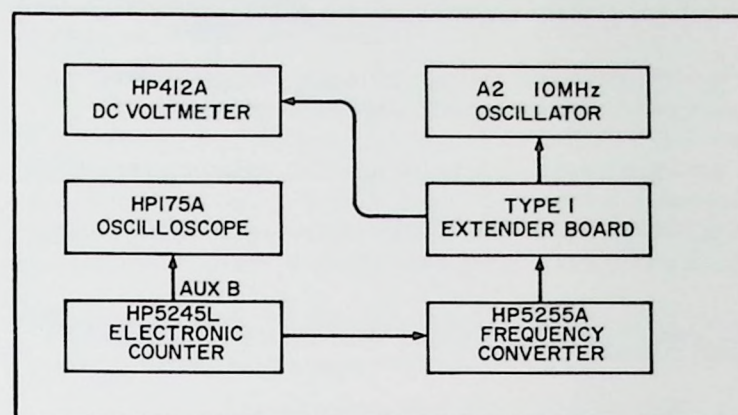


Figure 5-3. Phase Detector Test Setup



c. Set Counter controls as follows:

| | |
|-----------------------|-----------|
| SENSITIVITY | PLUG-IN |
| FUNCTION | FREQUENCY |

d. Connect the DC Voltmeter to pin N of the extender board.

e. Adjust the 10K ohm pot on the extender board until the DC level at 10M is +2 V.

f. Connect the DC Voltmeter to the BNC connector on the modified extender board.

g. Tune A1L1 for maximum output. The DC Voltmeter should read greater than +7 volts. The amplitude observed on the oscilloscope should be greater than 10 volts peak-to-peak.

5-12. 10 MHz OSCILLATOR A2.

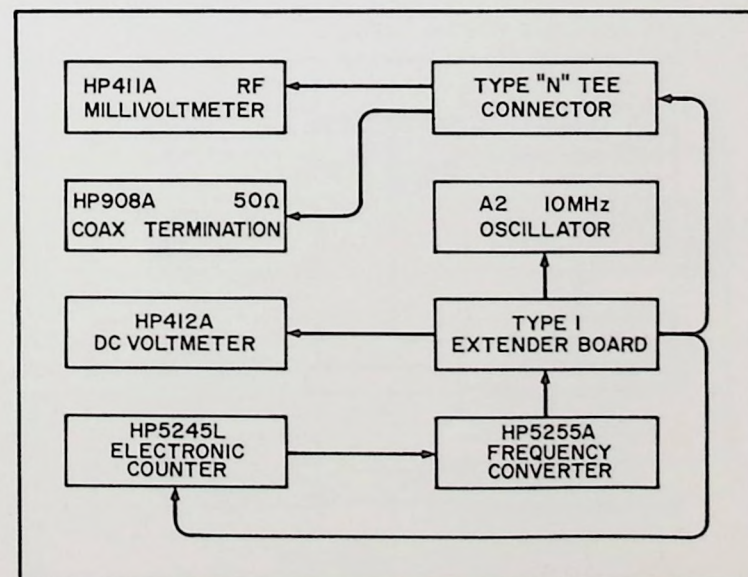
5-13. The following procedure adjusts 10 MHz oscillator for proper operation.

a. Connect equipment as shown in Figure 5-4.

b. Set counter controls as follows:

| | |
|-----------------------|-----------|
| SENSITIVITY | .1 V |
| TIME BASE | 1 S |
| FUNCTION | FREQUENCY |

Figure 5-4. 10 MHz Oscillator Test Setup



- c. Set the RF Millivoltmeter on the 1 V rms range.
- d. Set the DC voltmeter to +10 V range.
- e. Connect the output of the oscillator (BNC connector) to the counter at RF Millivoltmeter.
- f. Connect the probe of the DC voltmeter to pin N.
- g. Adjust the 10K ohm potentiometer for a reading of +2 volts dc.
- h. Adjust A2C8 for a counter reading of 9999.350 MHz \pm 20 kHz.
- i. Adjust A2C9 for maximum output.
- j. Recheck the counter reading to be sure it did not change. If necessary, readjust A2C8 for correct reading.

5-14. 50 MHz MULTIPLIER/AMPLIFIER A3.

5-15. The following procedure adjusts the 50 MHz Multiplier/Amplifier assembly for maximum output.

- a. Remove A4 200 MHz Multiplier/Amplifier assembly 05255-6001.

- b. Connect equipment as shown in Figure 5-5.

- c. Set counter controls as follows:

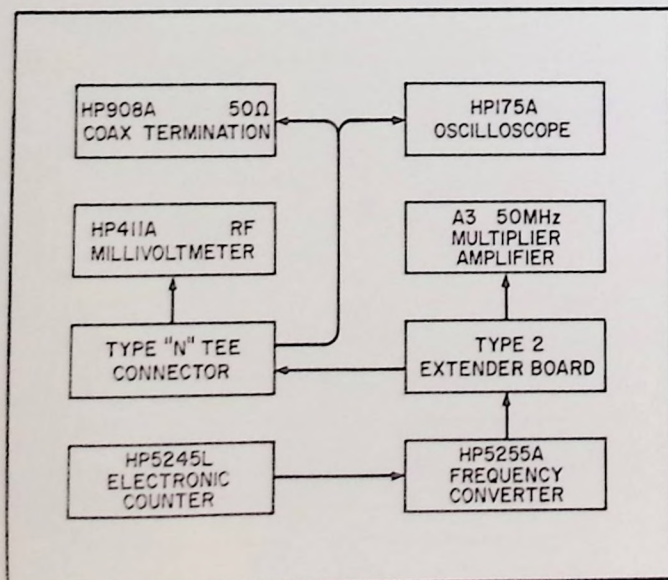
SENSITIVITY PLUG-IN
TIME BASE 10 ms
FUNCTION FREQUENCY

- d. Set oscilloscope controls as follows:

VERTICAL INPUT AC
VERTICAL SENSITIVITY5 V/cm
TRIGGERING INT
TRIGGER SLOPE NEG

- e. Set RF Millivoltmeter to 3 V rms range.

Figure 5-5. 50 MHz Multiplier/Amplifier Test Setup



- f. Tune capacitors A3C3, A3C7, A3C11, A3C14, and A3C17 for maximum output.

NOTE

Observe envelope on oscilloscope. Make sure that no quenching occurs.

- g. Repeat adjustment of capacitors back and forth several times to get absolute maximum output. After adjustments are complete replace A4 200 MHz Multiplier/Amplifier assembly.

5-16. 200 MHz MULTIPLIER/AMPLIFIER A4.

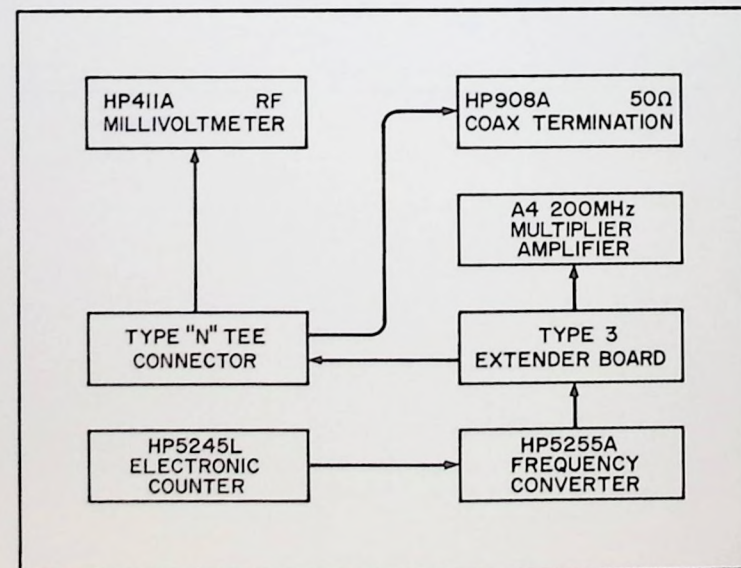
5-17. The following procedure adjusts the 200 MHz Multiplier/Amplifier assembly A4 for maximum output. Disconnect the output from A4 pin 5 going to the harmonic generator assembly A5. Connect the equipment as shown in Figure 5-6. Connect the RF Millivoltmeter to the output of A4 by using the selectroadapter. This is connected to the cable that normally goes to the harmonic generator A5. Tune capacitors A4C2, A4C5, A4C8, A4C10, A4C13, A4C15, and A4C18 for maximum output.

NOTE

The preceding adjustments are very critical and should be done very carefully.

- 5-18. Repeat the tuning procedure several times to ensure absolute maximum output. C18 may have more than 1 peak. Set it at the peak giving maximum output. The output signal amplitude from A4 is controlled by A4R12. During alignment, A4R12 should be set full clockwise (maximum output). When alignment is completed, A4R12 is adjusted for a 4 volt signal output. This prevents damage to the harmonic generator when A4 is reconnected to the unit. The final setting of A4R12 should be made with the harmonic generator assembly connected: Monitor the bias on the harmonic generator test point with a VTVM (hp 412A) and set A4R12 to give slightly less than maximum bias (usually between -8 and -12 volts). Generally the bias will reach a maximum negative value then begin to return toward zero as A4R12 is continuously tuned toward maximum output. The 200 MHz drive should be slightly below that giving maximum negative bias.

Figure 5-6. 200 MHz Multiplier/Amplifier Test Setup



5-19. HARMONIC GENERATOR A5.

5-20. The following procedure aligns the harmonic generator matching assembly.

NOTE

This alignment should not be attempted unless there is good reason to believe that the matching assembly is not in alignment.

a. Remove the two screws holding the side plates to the front panel. Remove the two screws holding the bottom plate to the rear frame. Carefully separate the two halves of the plug-in.

b. Remove the cover from the harmonic generator.

c. Connect the 5255A plug-in to the counter with an extender cable.

d. Connect an oscilloscope to test point 1 on the harmonic generator A5.

e. Turn on power.

f. Adjust A5L1 about 1/16 inch down from the top of the coil form.

g. Slowly tune capacitor A5C2 while rapidly tuning capacitor A5C3 back and forth while looking for an absolute peak on the oscilloscope. (A5C2 may be tuned rapidly and A5C3 slowly.)

5-21. Another method of aligning the harmonic generator is using a reflectometer system. This is a very sensitive method and is tuned for a very sharp null.

a. Remove harmonic generator from 5255A plug-in.

b. Connect test equipment as shown in Figure 5-7.

c. Adjust the coil slug A5L1 to about 1 turn below the top of the coil form.

d. Using two tuning wands adjust A5C2 and A5C3 so that the reflected signal is less than 5 millivolts.

5-22. MIXER DIODE CHECK.

a. Take the plus lead from the mixer and connect center conductor to positive part of diode curve tracer or transistor checker.

b. Connect center conductor of RF input to mixer and ground of mixer to negative terminal of curve tracer or transistor checker.

c. Measure the current at 1 volt (since there is a resistive pad in series with the mixer diodes the forward conductance will appear to be less than that of the diodes alone). The current should be between 5 and 20 milliamperes. With a 100K series protective resistor the reverse voltage may be measured.

d. Run the voltage out to 5 V or less or until the current reads 10 μ amps.

CAUTION

Do not exceed 5 volts or 10 microamps in the reverse direction. Do not use less than 100K protective resistor. The diode should take at least 3.5 V in the reverse direction and draw less than 10 μ amps at 3.5 V. Keep the reverse voltage on the diode only long enough to make the measurement.

When the positive or plus diode has been tested reverse the curve tracers polarity and check the negative diode in the same way.

5-23. CONTROL BOARD A9.

5-24. The following procedure checks the control board for proper operation. The initial test is made without connecting the 5255A plug-in to the counter.

a. Remove the top and side covers of the 5255A plug-in.

b. Connect the control board to the converter by using the extender board.

c. Disconnect the prescaler input from the video amplifier output.

d. Connect test equipment as shown in Figure 5-8.

Figure 5-7. Harmonic Generator Test Setup

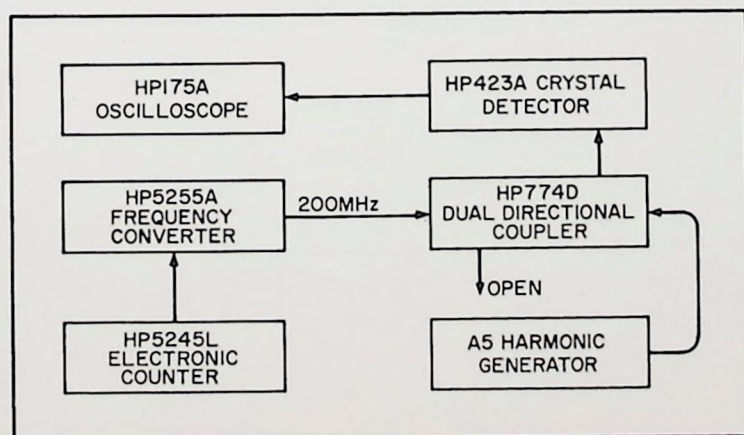
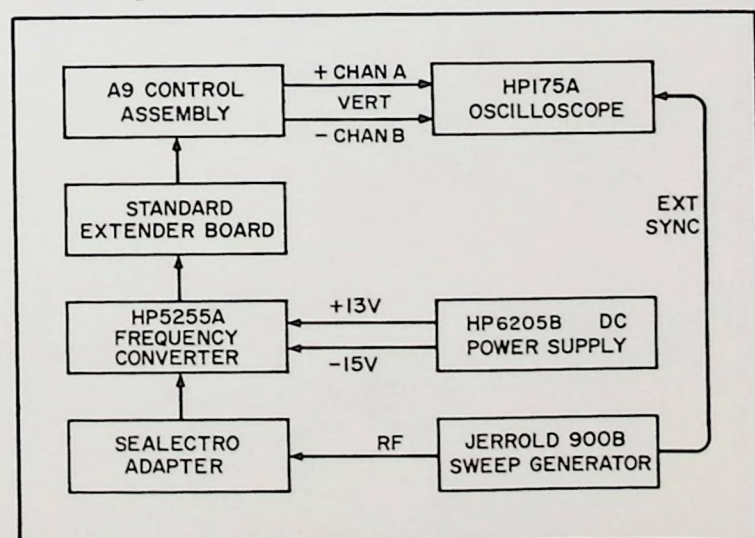


Figure 5-8. Control Assembly Test Setup



e. Set oscilloscope controls as follows:

VERTICAL SENSITIVITY 1 V/cm
 VERTICAL INPUT DC
 HORIZONTAL TIME BASE 1 V/cm
 HORIZONTAL INPUT DC
 CHANNEL A Polarity +
 CHANNEL B Polarity -

f. Set the controls of the Jerrold sweep generator as follows:

FREQUENCY 212 MHz
 BAND SELECTOR VHF
 ATTENUATOR 0 dB
 RF OUTPUT maximum clockwise
 SWEEP WIDTH maximum clockwise

g. Set DC Voltmeter to -1 V range. Connect negative lead to A9Q1 collector. Connect positive lead to A9Q2 collector.

h. Adjust A9R4 for an output voltage of -.6 volts \pm .1 volt dc.

i. Remove the DC Voltmeter probes.

j. Connect scope probe CHANNEL B to the collector of A9Q1; CHANNEL A to the collector of A9Q2.

k. Connect the Jerrold sweep generator RF output to the prescaler input.

l. Adjust the horizontal gain of the oscilloscope so the display is 10 cm wide. Move the position control so zero input (vertical disconnected) is exactly on the center line.

m. Adjust the phasing control on the sweeper by pushing the knob in and tuning until the trace and the retrace coincide. Pull the knob back out.

n. Adjust A9C1 and A9C4 so that the trace crossover line is very steep (the steeper the better) on the right side above crossover. The curve is always greater than 1/2 volt positive to at least 390 MHz.

o. Turn the sweep width fully counterclockwise and push the phasing knob in. Disconnect the sweeper from the prescaler input and connect it to the AUX IN connector on the front panel of the 5255A plug-in.

p. Reconnect the prescaler input to the video amplifier output.

q. Remove the DC power supply and connect the 5255A plug-in to the counter by an extender cable.

Figure 5-9. Mixer and Cavity Parts

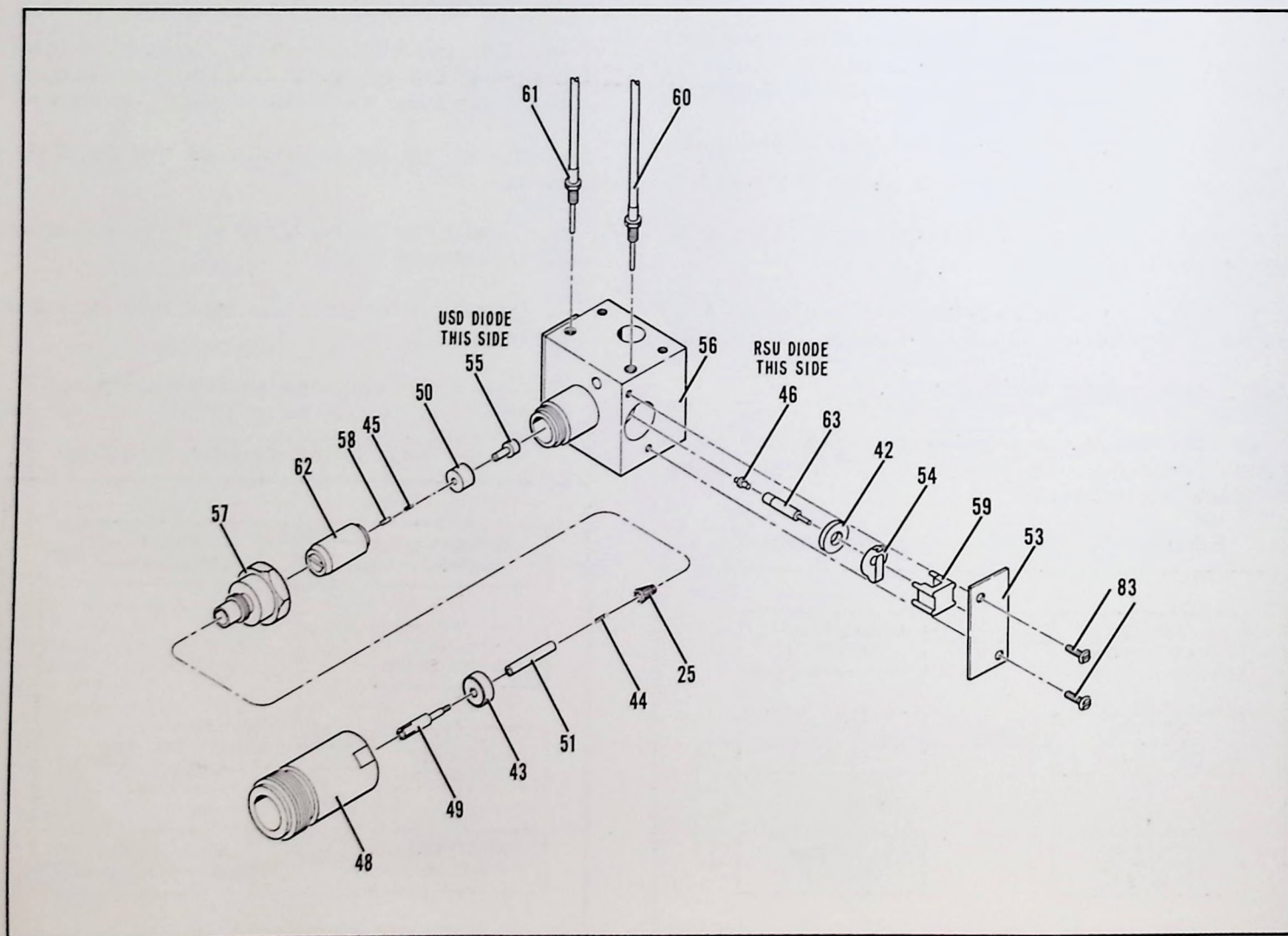
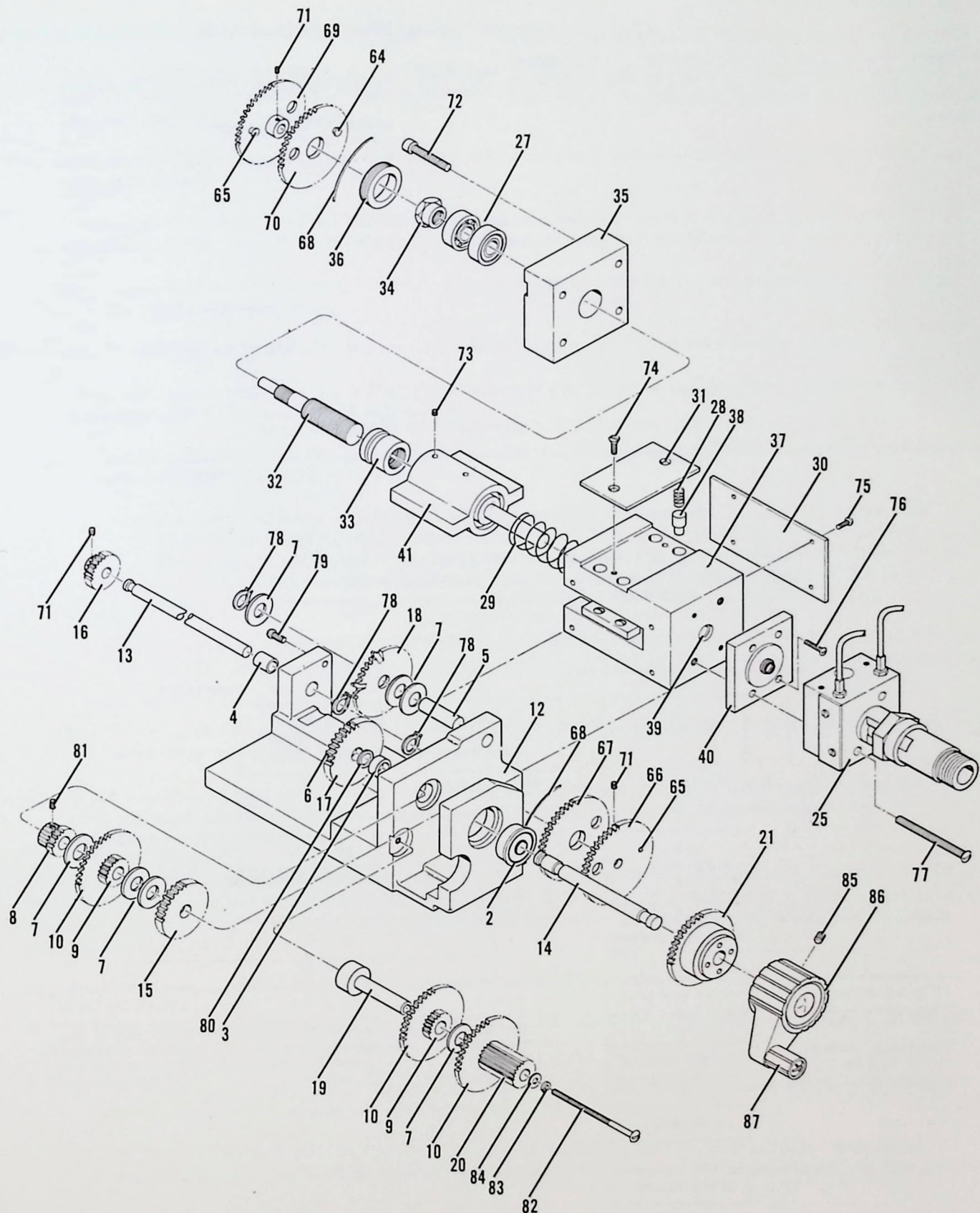


Figure 5-10. Tuning Cavity Mechanical Parts



r. Set counter controls as follows:

SENSITIVITY PLUG-IN
TIME BASE1 ms
FUNCTION FREQUENCY

s. Turn counter on.

t. Change the frequency of the sweep generator until the counter starts reading (the needle of the meter moves into the green area). The reading should be 212 MHz \pm 1 MHz. If reading is incorrect repeat test procedure.

5-25. TROUBLESHOOTING.

5-26. The following procedure applies when one of these conditions is present:

- No meter reading for a microwave input.
- Low sensitivity indicated on meter.
- Incorrect readings.

Figure 5-11. Troubleshooting Block Diagram

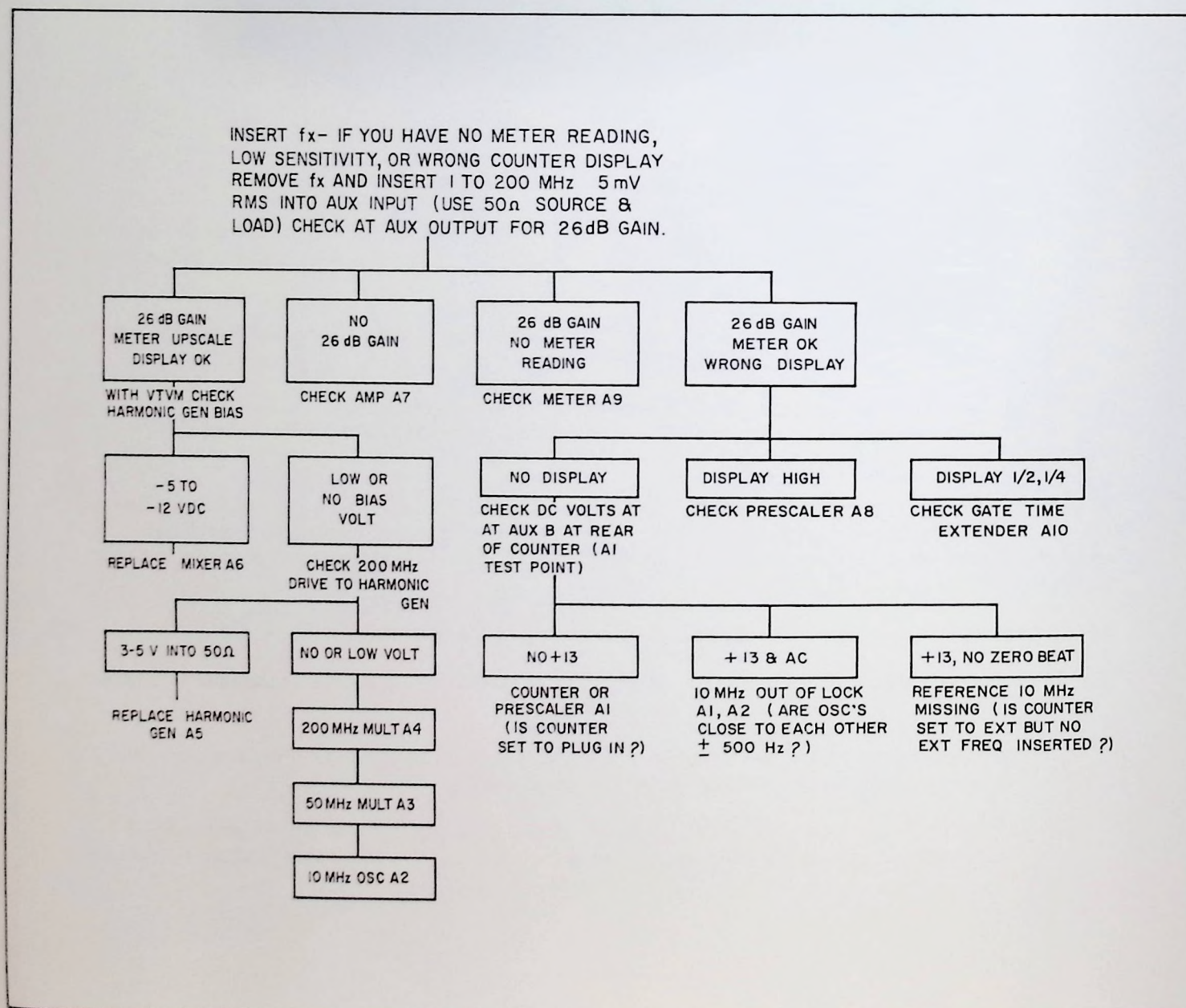


Table 5-4. Troubleshooting Procedure

1. Disconnect main input, check if auxiliary input operates correctly.
 - a. If not, check gain between Auxiliary Input and Auxiliary Output with a signal between 1 MHz and 200 MHz. Gain should be approximately 26 dB (50 ohm source and load) for low level (approximately 2-5 mV) input.
 - b. If amplifier gain is correct but the meter does not move upscale the meter circuitry is probably defective.
 - c. If the gain is correct and the meter moves upscale but the counter display is not correct, the prescaler or gate time extender (or the counter) may be defective.
 - 1) If the display is 1/2 or 1/4 of the correct frequency the gate time extender is probably not operating correctly.
 - 2) If the display is higher than the correct value the prescaler may be the cause.
 - d. If the gain is correct and the meter reads upscale but there is not display, check the dc voltage at the AUX B output of the counter.
 - 1) If the voltage is +13 the prescaler is held from operating by a No Lock signal from the control board assembly.
 - a) If a low frequency ac signal is present at AUX B in addition to the +13 volts, the 10 MHz oscillator in the plug-in is out of lock from the 10 MHz of the counter. The counter oscillator or the plug-in oscillator may be out of specifications, or an off-frequency external standard may be connected to the counter. (The lock range of the system is approximately ± 500 Hz at 10 MHz.)
 - b) If there is a +13 signal at AUX B but there is no large beat note present, the reference 10 MHz may be missing. (The counter may be set to EXT reference with no external reference connected.)
 - 2) If zero, the counter may not be set to plug-in mode, the counter may be defective or the prescaler assembly may have failed.
 - e. If the auxiliary input operates in some parts of its frequency range but does not operate even with reduced sensitivity in other parts of its frequency range the control board may be defective or misaligned.
2. If auxiliary input operation is correct (but not main input), using a VTVM check the bias on the harmonic generator assembly test point. (This test point may be reached by removing the machine screw on top of the harmonic generator assembly.) This test point should be between approximately -5 and -12 volts dc.
 - a. If the bias is correct, the difficulty is probably in the mixer.
 - b. If there is no bias, check the 200 MHz drive to the harmonic generator assembly. It should be approximately 3-5 volts rms into 50 ohms.
 - 1) If there is no bias, but if there is adequate drive, the harmonic generator is probably defective and the assembly should be replaced.
 - 2) If there is no 200 MHz drive present, check first the 200 MHz multiplier amplifier assembly then the 50 MHz multiplier assembly then the 10 MHz oscillator, in that order.

Table 5-5. In-Cabinet Performance Check

1. **RANGE:** As a converter: 3 to 12.4 GHz
As a prescaler: 1 to 200 MHz

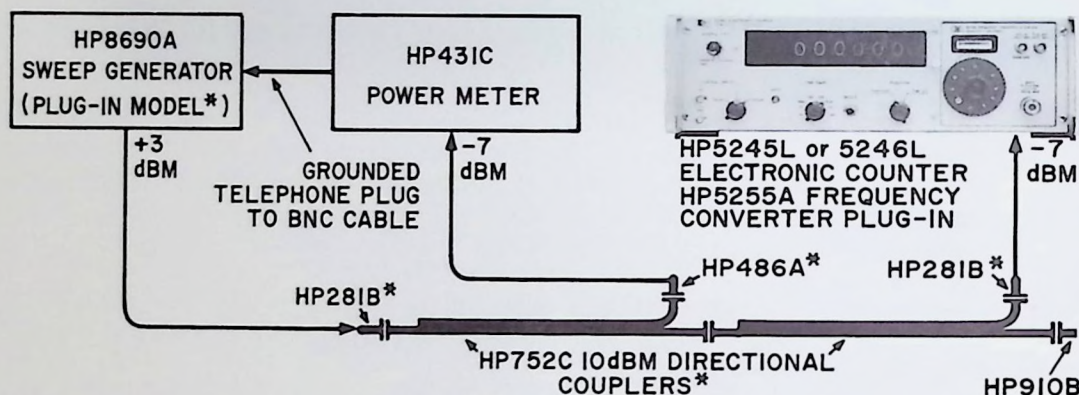
AS A CONVERTER (Input 3 to 12.4 GHz):

- a. Set Counter controls as follows:

| | |
|-----------------------|-------------------------------------|
| SAMPLE RATE | slightly clockwise out of POWER OFF |
| SENSITIVITY | PLUG-IN |
| TIME BASE | .1 ms |
| FUNCTION | FREQUENCY |

- b. Connect HP Model 8692A Signal Generator CAL RF POWER OUTPUT connector to the 5255A Converter INPUT 3-12.4 GHz connector. Set Generator output level to -7 dBm.
- c. Vary frequency from 2.0 GHz to 4.0 GHz, keeping output constant at -7 dBm. Counter display plus Converter dial reading should properly indicate frequencies in this range. (Converter is tuned from low end of dial for first maximum indication on Level Indicator.)

Figure 5-12. Frequency Range Check



* SEE TABLE 5-3 FOR MODELS NEEDED TO COVER G THROUGH X BANDS

- d. Substitute the HP Model 8693A Signal Generator for the 8692A using hookup in Figure 5-12 above. Set Generator for CW operation.
- e. Vary frequency from 4.0 GHz to 8.0 GHz, keeping output constant at -7 dBm. Counter display plus Converter dial reading should properly indicate frequencies in this range.
- f. Substitute the HP Model 8694A Signal Generator for the 8693A, using hookup in Figure 5-12. Set the Generator output for a -7 dBm reading on the HP Model 431C Power Meter.
- g. Vary frequency from 8 GHz to 12.4 GHz, keeping output constant at -7 dBm. Counter display plus Converter dial reading should properly indicate frequencies in this range.

AS A PRESCALER (AUX IN 1 to 200 MHz):

- a. Set Counter as follows:

| | |
|-----------------------|-------------------------------------|
| SAMPLE RATE | slightly clockwise out of POWER OFF |
| SENSITIVITY | PLUG-IN |
| TIME BASE | 1 S |
| FUNCTION | FREQUENCY |

- b. Connect HP Model 651A Signal Generator OUTPUT connector to 5255A Converter AUX IN 1-200 MHz connector using a BNC "T" adapter. Monitor the Converter input with a HP Model 411A connected to the other BNC "T" port.

Table 5-5. In-Cabinet Performance Check (Cont'd.)

AS A PRESCALER (Cont'd.)

- c. Vary frequency from 1 MHz to 10 MHz, keeping output constant at 5 mV. Counter should properly display frequencies directly.
- d. Substitute HP Model 3200B for the 651A.
- e. Vary frequency from 10 MHz to 201 MHz, keeping output constant at 5 mV. Counter should properly display frequencies directly.

2. **INPUT SIGNAL LEVEL:** As a converter: 100 mV (INPUT 3-12.4 GHz)
As a prescaler: 5 mV (AUX IN 1-200 MHz)

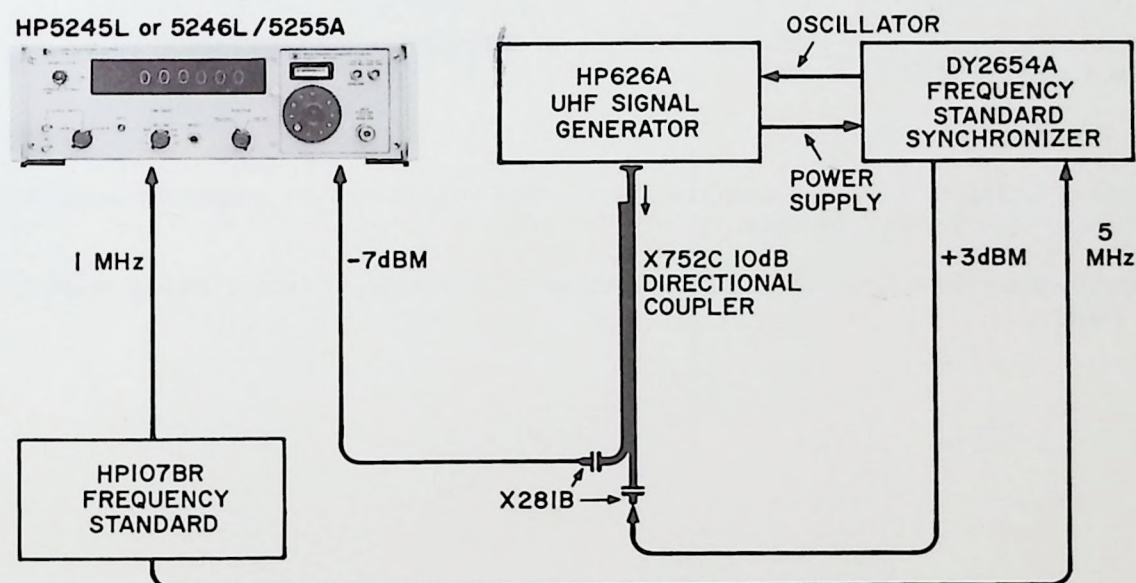
Input signal level specifications are verified by procedure 1, RANGE check.

3. **ACCURACY:** same as basic counter

AS A CONVERTER (INPUT 3-12.4 GHz):

- a. Use hookup in Figure 5-13 to check measurement accuracy of measured frequencies in 3 GHz to 12.4 GHz range.

Figure 5-13. Measurement Accuracy Check



- b. Set Counter controls as follows:

| | |
|-----------------------|-------------------------------------|
| SAMPLE RATE | slightly clockwise out of POWER OFF |
| SENSITIVITY | PLUG-IN |
| TIME BASE | 1 S |
| FUNCTION | FREQUENCY |

- c. Set HP Model 626A controls as follows:

| | |
|--------------------------|---|
| Frequency Dial | near 12 GHz |
| MOD SELECTOR | OFF |
| ZERO SET | adjust for power-monitor meter indication exactly on the ZERO SET index |
| MOD SELECTOR | CW |
| PWR SET. | adjust for power-monitor meter indication exactly on the PWR SET index |
| OUTPUT ATTEN | 3 dBm |

Table 5-5. In-Cabinet Performance Check (Cont'd.)

AS A CONVERTER (Cont'd.)

- d. Adjust Generator frequency until lock occurs (DY 2654A I. F. LEVEL in green and PHASE METER centered). Check for proper lock by changing frequency dial slightly above and below setting; phase meter should move almost full scale + and - if lock is correct.
- e. Tune Converter from well below "unknown" frequency until first indication occurs in green on Level Indicator. Peak the Level Indicator reading.
- f. The Converter dial reading (GHz) plus the Counter reading (MHz) should be equal to Generator frequency (signal generator dial is $\pm 1\%$).

AS A PRESCALER (AUX IN 1-200 MHz):

- a. Set Counter as follows:

| | |
|-----------------------|-------------------------------------|
| SAMPLE RATE | slightly clockwise out of POWER OFF |
| SENSITIVITY | PLUG-IN |
| TIME BASE | 1 S |
| FUNCTION | FREQUENCY |

- b. Connect series HP Model 355C and 355D Attenuators (set total attenuation for 30 dB) between 1 MHz OUTPUT STD FREQ connector at rear of Counter and connector AUX IN 1-200 MHz Converter.
- c. 5255A Level Indicator should read more than 3. Counter display should be 1 MHz ± 1 count.
- d. Increase attenuation in 1 dB steps until Level Indicator reads approximately 3. Counter should still display 1 MHz ± 1 count.
- e. Set Counter as in step a.
- f. Connect 3200B to AUX IN connector. Set series attenuators for a total attenuation of 62 dB. Set Generator for 201.00 MHz.
- g. Adjust attenuators for approximately 3 on Level Indicator. Counter should display 201.00 MHz ± 1 count.

Hewlett-Packard Model 5255A
Instrument Serial No. _____ - _____

Tests Performed by _____
Date _____

PERFORMANCE CHECK TEST CARD

| DESCRIPTION | CHECK |
|---|---|
| 1. RANGE: As a Converter: 3 to 12.4 GHz As a Prescaler: 1 to 200 MHz | <div><input type="text"/> 3 to 12.4 GHz</div> <div><input type="text"/> 1 to 200 MHz</div> |
| 2. INPUT SIGNAL LEVEL: As a Converter: 100 mV (INPUT 3-12.4 GHz) As a Prescaler: 5 mV (AUX IN 1-200 MHz) | <div><input type="text"/> 100 mV</div> <div><input type="text"/> 5 mV</div> |
| 3. ACCURACY: As a Converter As a Prescaler | <div><input type="text"/> same as basic Counter</div> <div><input type="text"/> same as basic Counter</div> |

SECTION VI

REPLACEABLE PARTS

6-1. INTRODUCTION.

6-2. This section contains information for ordering replacement parts. Table 6-1 lists parts in alpha-numerical order of their reference designators and indicates the description and HP stock number of each part, together with any applicable notes. Table 6-2 lists parts in alpha-numerical order of their HP stock number and provides the following information on each part;

- a. Description of the part (see list of abbreviations below).
- b. Typical manufacturer of the part in a five-digit code; see list of manufacturers in Table 6-3.
- c. Manufacturer's part number.
- d. Total quantity used in the instrument (TQ column).

6-3. Miscellaneous parts are listed at the end of Table 6-1.

6-4. ORDERING INFORMATION.

6-5. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard Field Office (see lists at rear of this manual for addresses). Identify parts by their Hewlett-Packard stock numbers.

6-6. To obtain a part that is not listed, include:

- a. Instrument model number.
- b. Instrument serial number.
- c. Description of the part.
- d. Function and location of the part.

REFERENCE DESIGNATORS

| | | | | | | | |
|----|---------------------------|----|------------------------|----|------------------|----|----------------------|
| A | = assembly | E | = misc electronic part | P | = plug | V | = vacuum, tube, neon |
| B | = motor | F | = fuse | Q | = transistor | VR | = voltage regulator |
| BT | = battery | FL | = filter | R | = resistor | W | = cable |
| C | = capacitor | J | = jack | RT | = thermistor | X | = socket |
| CP | = coupler | K | = relay | S | = switch | Y | = crystal |
| CR | = diode | L | = inductor | T | = transformer | | |
| DL | = delay line | M | = meter | TB | = terminal board | | |
| DS | = device signaling (lamp) | MP | = mechanical part | TP | = test point | | |

ABBREVIATIONS

| | | | | | | | |
|----------|-------------------------------|---------|---|--------|---|---------|----------------------------|
| A | = amperes | H | = henries | NPN | = negative-positive-negative | RMS | = root-mean square |
| A. F. C. | = automatic frequency control | HEX | = hexagonal | NRFR | = not recommended for field replacement | RWV | = reverse working voltage |
| AMPL | = amplifier | HG | = mercury | NSR | = not separately replaceable | S-B | = slow-blow |
| B. F. O. | = beat frequency oscillator | HR | = hour(s) | OBD | = order by description | SCR | = screw |
| BE CU | = beryllium copper | IF | = intermediate freq | OH | = oval head | SE | = selenium |
| BH | = binder head | IMPG | = impregnated | OX | = oxide | SECT | = section(s) |
| BP | = bandpass | INCD | = incandescent | P | = peak | SEMICON | = semiconductor |
| BRS | = brass | INCL | = include(s) | PC | = printed circuit | SI | = silicon |
| BWO | = backward wave oscillator | INS | = insulation(ed) | PF | = picofarads = 10 ⁻¹² farads | SIL | = silver |
| CCW | = counter-clockwise | INT | = internal | PH BRZ | = phosphor bronze | SL | = slide |
| CER | = ceramic | K | = kilo = 1000 | PHL | = Phillips | SPG | = spring |
| CMO | = cabinet mount only | LH | = left hand | PIV | = peak inverse voltage | SPL | = special |
| COEF | = coefficient | LIN | = linear taper | PNP | = positive-negative-positive | SST | = stainless steel |
| COM | = common | LK WASH | = lock washer | P/O | = part of | SR | = split ring |
| COMP | = composition | LOG | = logarithmic taper | POLY | = polystyrene | STL | = steel |
| COMPL | = complete | LPF | = low pass filter | PORC | = porcelain | TA | = tantalum |
| CONN | = connector | M | = milli = 10 ⁻³ | POS | = position(s) | TD | = time delay |
| CP | = cadmium plate | MEG | = meg = 10 ⁶ | POT | = potentiometer | TGL | = toggle |
| CRT | = cathode-ray tube | MET FLM | = metal film | PP | = peak-to-peak | THD | = thread |
| CW | = clockwise | MET OX | = metallic oxide | PT | = point | TI | = titanium |
| DEPC | = deposited carbon | MFR | = manufacturer | PWV | = peak working voltage | TOL | = tolerance |
| DR | = drive | MINAT | = miniature | RECT | = rectifier | TRIM | = trimmer |
| ELECT | = electrolytic | MOM | = momentary | RH | = round head or right hand | TWT | = traveling wave tube |
| ENCAP | = encapsulated | MTG | = mounting | RMO | = rack mount only | U | = micro = 10 ⁻⁶ |
| EXT | = external | MY | = "mylar" | | | VAR | = variable |
| F | = farads | N | = nano (10 ⁻⁹) | | | VDCW | = dc working volts |
| FH | = flat head | N/C | = normally closed | | | W/ | = with |
| FIL H | = fillister head | NE | = neon | | | W | = watts |
| FXD | = fixed | NI PL | = nickel plate | | | WIV | = working inverse voltage |
| GE | = germanium | N/O | = normally open | | | WW | = wirewound |
| GL | = glass | NPO | = negative positive zero (zero temperature coefficient) | | | W/O | = without |
| GRD | = ground(ed) | | | | | | |

Table 6-1. Reference Designation Index

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|--------------------------|---|------|
| A1 | 05255-6004 05255-2004 | ASSY:PHASE DETECTOR BOARD BOARD- BLANK | |
| A1C1 | 0160-0179 | C:FXD MICA 33 PF 5% | |
| A1C2 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C3 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C4 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C5 | 0140-0192 | C:FXD MICA 68 PF 5% | |
| A1C6 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C7 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C8 | 0160-0179 | C:FXD MICA 33 PF 5% | |
| A1C9 | 0140-0176 | C:FXD MICA 100 PF 2% | |
| A1C10 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C11 | 0140-0176 | C:FXD MICA 100 PF 2% | |
| A1C12 | 0180-0101 | C:FXD ELECT 1.8 UF 10% 35VDCW | |
| A1C13 | 0180-0291 | C:FXD ELECT 1 UF 10% 35VDCW | |
| A1C14 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A1C15 | 0170-0055 | C:FXD MY 0.1 UF 20% 200VDCW | |
| A1C16 | 0140-0152 | C:FXD MICA 1000 PF 5% 300VDCW | |
| A1CR1 | 1910-0022 | DIODE:GERMANIUM 5 WIV | |
| A1CR2 | 1910-0022 | DIODE:GERMANIUM 5 WIV | |
| A1CR3 | 1901-0022 | DIODE:SILICON 0.56V AT 1 MA | |
| A1CR4 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A1CR5 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A1CR6 | 1901-0025 | DIODE:SILICON 100 WV 12 PF | |
| A1CR7 | 1901-0025 | DIODE:SILICON 100 WV 12 PF | |
| A1L1 | 9140-0126 | COIL:VAR 1.76-4.02 MH | |
| A1Q1 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A1Q2 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A1Q3 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A1Q4 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A1Q5 | 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | |
| A1Q6 | 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | |
| A1Q7 | 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | |
| A1Q8 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A1R1 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A1R2 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A1R3 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A1R4 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| A1R5 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A1R6 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A1R7 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| A1R8 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A1R9 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A1R10 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A1R11 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A1R12 | 0757-0912 | R:FXD MET FLM 330 OHM 2% 1/8W | |
| A1R13 | 0757-0941 | R:FXD MET FLM 5.1K OHM 2% 1/8W | |
| A1R14 | 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | hp Stock No. | Description # | Note |
|-----------------------|--------------------------|---|------|
| A1R15 | 0757-0972 | R:FXD MET FLM 100K OHM 2% 1/8W | |
| A1R16 | 0757-0950 | R:FXD MET FLM 12K OHM 2% 1/8W | |
| A1R17 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A1R18 | 0757-0930 | R:FXD MET FLM 1.8K OHM 2% 1/8W | |
| A1R19 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A1R20 | 0757-0949 | R:FXD MET FLM 11K OHM 2% 1/8W | |
| A1R21 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A1R22 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A1R23 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A1R24 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A1R25 | 0757-0972 | R:FXD MET FLM 100K OHM 2% 1/8W | |
| A2 | 05255-6003 05255-2003 | BD. ASSY. OSCILLATOR BOARD- BLANK | |
| A2C1 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A2C2 | 0160-0161 | C:FXD MY 0.01 UF 10% 200VDCW | |
| A2C3 | 0170-0055 | C:FXD MY 0.1 UF 20% 200VDCW | |
| A2C4 | 0140-0152 | C:FXD MICA 1000 PF 5% 300VDCW | |
| A2C5 | 0160-0161 | C:FXD MY .01 UF 10% 200VDCW | |
| A2C6 | 0160-0157 | C:FXD MY 0.0047 UF 10% 200VDCW | |
| A2C7 | 0140-0207 | C:FXD MICA 330 PF 5% | |
| A2C8 | 0131-0004 | C:VAR MICA 16-150 PF 175VDCW | |
| A2C9 | 0131-0006 | C:VAR MICA 70-350 PF 175VDCW | |
| A2C10 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A2C11 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A2C12 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A2CR1 | 0122-0006 | C:VAR 100 PF 20% 20WV | |
| A2CR2 | 0122-0006 | C:VAR 100 PF 20% 20WV | |
| A2L1 | 9140-0029 | COIL:RF CHOKE 100 MH | |
| A2L2 | 9140-0029 | COIL:RF CHOKE 100 MH | |
| A2L3 | 9140-0029 | COIL:RF CHOKE 100 MH | |
| A2Q1 | 1854-0022 | TRANSISTOR:SILICON NPN | |
| A2Q2 | 1854-0022 | TRANSISTOR:SILICON NPN | |
| A2Q3 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A2R1 | 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | |
| A2R2 | 0757-0954 | R:FXD MET FLM 18K OHM 2% 1/8W | |
| A2R3 | 0757-0944 | R:FXD MET FLM 6.8K OHM 2% 1/8W | |
| A2R4 | 0757-0930 | R:FXD MET FLM 1.8K OHM 2% 1/8W | |
| A2R5 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A2R6 | 0757-0944 | R:FXD MET FLM 6.8K OHM 2% 1/8W | |
| A2R7 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A2R8 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A2R9 | 0757-0387 | R:FXD MET FLM 27.4 OHM 2% 1/8W | |
| A2Y1 | 0410-0130 1200-0159 | CRYSTAL:QUARTZ 10 MHZ SOCKET:CRYSTAL | |
| A3 | 05255-6002 05255-2002 | ASSY:MULTIPLIER AMPLIFIER 50 MHZ BOARD-BLANK | |
| A3C1 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|--------------------------|---|------|
| A3C2 | 0140-0145 | C:FXD MICA 22 PF 5% | |
| A3C3 | 0121-0037 | C:VAR CER 7-25 PF | |
| A3C4 | 0150-0091 | C:FXD CER 1.5/0.25 PF 500VDCW | |
| A3C5 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A3C6 | 0140-0145 | C:FXD MICA 22 PF 5% | |
| A3C7 | 0121-0037 | C:VAR CER 7-25 PF | |
| A3C8 | 0150-0091 | C:FXD CER 1.5/0.25 PF 500VDCW | |
| A3C9 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A3C10 | 0140-0145 | C:FXD MICA 22 PF 5% | |
| A3C11 | 0121-0037 | C:VAR CER 7-25 PF | |
| A3C12 | 0150-0059 | C:FXD CER 3.3/0.25 PF 600VDCW | |
| A3C13 | 0140-0145 | C:FXD MICA 22 PF 5% | |
| A3C14 | 0121-0037 | C:VAR CER 7-25 PF | |
| A3C15 | 0150-0059 | C:FXD CER 3.3/0.25 PF 600VDCW | |
| A3C16 | 0140-0201 | C:FXD MICA 12 PF 5% | |
| A3C17 | 0121-0037 | C:VAR CER 7-25 PF | |
| A3C18 | 0160-0205 | C:FXD MICA 10 PF 5% | |
| A3C19 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A3C20 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A3L1 | 9140-0095 | COIL:FXD RF 0.27 MH 10% | |
| A3L2 | 9140-0095 | COIL:FXD RF 0.27 MH 10% | |
| A3L3 | 9140-0095 | COIL:FXD RF 0.27 MH 10% | |
| A3L4 | 9140-0095 | COIL:FXD RF 0.27 MH 10% | |
| A3L5 | 9140-0095 | COIL:FXD RF 0.27 MH 10% | |
| A3Q1 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A3Q2 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A3Q3 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A3R1 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R2 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R3 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R4 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R5 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R6 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A3R7 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R8 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A3R9 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A4 | 05255-6001 05255-2001 | BOARD ASSY.- 200MHZ AMPLIFIER BOARD- BLANK | |
| A4C1 | 0140-0209 | C:FXD MICA 5.0 PF 10% | |
| A4C2 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C3 | 0140-0209 | C:FXD MICA 5.0 PF 10% | |
| A4C4 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4C5 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C6 | 0150-0091 | C:FXD CER 1.5/0.25 PF 500VDCW | |
| A4C7 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4C8 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C9 | 0150-0088 | C:FXD CER 3.9/0.25 PF 500VDCW | |
| A4C10 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C11 | 0150-0091 | C:FXD CER 1.5/0.25 PF 500VDCW | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------------|---|------|
| A4C12 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4C13 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C14 | 0150-0088 | C:FXD CER 3.9/0.25 PF 500VDCW | |
| A4C15 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C16 | 0140-0209 | C:FXD MICA 5.0 PF 10% | |
| A4C17 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4C18 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A4C19 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4C20 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A4L1 | 9140-0120 | COIL:FXD 0.1 MH 20% | |
| A4L2 | 05255-6019 | COIL ASSY | |
| A4L3 | 05255-6019 | COIL ASSY | |
| A4L4 | 05255-6019 | COIL ASSY | |
| A4L5 | 05255-6019 | COIL ASSY | |
| A4L6 | 05255-6019 | COIL ASSY | |
| A4L7 | 05255-6019 | COIL ASSY | |
| A4L8 | 05255-6019 | COIL ASSY | |
| A4Q1 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A4Q2 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A4Q3 | 1854-0092 | TRANSISTOR:SILICON NPN | |
| A4Q4 | 1854-0019 | TRANSISTOR:SILICON NPN | |
| A4Q5 | 1854-0233 | TRANSISTOR:SILICON NPN 2N3866 | |
| A4R1 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A4R2 | 0757-0946 | R:FXD MET FLM 8.2K OHM 2% 1/8W | |
| A4R3 | 0757-0944 | R:FXD MET FLM 6.8K OHM 2% 1/8W | |
| A4R4 | 0757-0916 | R:FXD MET FLM 470 OHM 2% 1/8W | |
| A4R5 | 0757-0946 | R:FXD MET FLM 8.2K OHM 2% 1/8W | |
| A4R6 | 0757-0946 | R:FXD MET FLM 8.2K OHM 2% 1/8W | |
| A4R7 | 0757-0915 | R:FXD MET FLM 430 OHM 2% 1/8W | |
| A4R8 | 0757-0950 | R:FXD MET FLM 12K OHM 2% 1/8W | |
| A4R9 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A4R10 | 0757-0905 | R:FXD MET FLM 160 OHM 2% 1/8W | |
| A4R11 | 0757-0910 | R:FXD MET FLM 270 OHM 2% 1/8W | |
| A4R12 | 2100-1758 | R:VAR WW 1K OHM 10% LIN 1/2W | |
| A4R13 | 0757-0379 | R:FXD MET FLM 12.1 OHM 2% 1/8W | |
| A5 | 05255-6016 | ASSY:HARMONIC GENERATOR NOT RECOMMENDED FOR FIELD REPLACEMENTS | |
| A5C1 | THRU THRU | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5C4 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5CR1 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5J1 | | NOT ASSIGNED | |
| A5J9 | | CONNECTOR:RF | |
| A5J10 | 1250-0829 | | |
| A5L1 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5R1 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5R2 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A5R3 | | NSR PART OF HARMONIC GENERATOR ASSY | |
| A6 | 05255-6013 | MIXER-CAVITY ASSY NOT RECOMMENDED FOR FIELD REPLACEMENTS | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|--|--|--|------|
| A6C1,C2 A6CR1,CR2 A6E1,E2 A6P1 THRU A6P6 A6P7 A6P8 A6R1,R2,R3 A6W1 A6W2 | 1250-0821 1250-0821 05255-2059 05255-6023 05255-6024 08491-2006 08551-2108 | NSR PART OF MIXER/CAVITY ASSY NSR PART OF MIXER/CAVITY ASSY NSR PART OF MIXER/CAVITY ASSY NOT ASSIGNED CONNECTOR:RF, PART OF A6W1 CONNECTOR:RF, PART OF A6W2 CARD-ATTENUATOR CABLE ASSY:(+)INPUT, INCLUDES A6P7 CABLE ASSY:(-)INPUT, INCLUDES A6P8 SHELL:CARTRIDGE GUIDES:CARD | |
| A7A1 | 05255-6008 05255-2008 | BOARD ASSY.-200 MHZ VIDEO AMPLIFIER BOARD- BLANK PREFIX THE FOLLOWING PARTS A7 | |
| A1C1 A1C2 A1C3 A1C4 A1C5 | 0150-0093 0160-2356 0160-2356 0160-2356 0180-0218 | C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD ELECT .15 UF 10% 35VDCW | |
| A1C6 A1C7 A1C8 A1C9 A1C10 | 0150-0093 0180-0218 0180-0230 0160-2356 0180-0230 | C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD ELECT .15 UF 10% 35VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD ELECT 1 UF 20% 50VDCW | |
| A1C11 A1C12 A1C13 A1C14 A1C15 | 0180-0230 0180-0230 0160-2356 0180-0230 0160-2356 | C:FXD ELECT 1 UF 20% 50VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW | |
| A1C16 A1C17 A1C18 A1C19 A1C20 | 0150-0093 0180-0230 0160-2356 0180-0230 0160-2356 | C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW | |
| A1C21 A1C22 A1C23 A1C24 A1C25 | 0180-0230 0180-0230 0160-2356 0160-2356 0160-2356 | C:FXD ELECT 1 UF 20% 50VDCW C:FXD ELECT 1 UF 20% 50VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD CER 6800 PF 20% 200VDCW C:FXD CER 6800 PF 20% 200VDCW | |
| A1C26 A1C27 A1C28 A1C29 A1C30 | 0150-0093 0150-0050 0150-0093 0150-0050 0121-0060 | C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD CER 0.001 UF 600VDCW C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD CER 0.001 UF 600VDCW C:VAR CER 2-8 PF | |
| A1C31 A1C32 A1C33 A1C34 A1C35 | 0160-2356 0180-0218 0150-0050 0180-0155 0150-0050 | C:FXD CER 6800 PF 20% 200VDCW C:FXD ELECT .15 UF 10% 35VDCW C:FXD CER 0.001 UF 600VDCW C:FXD ELECT 2.2 PF 20% 20VDCW C:FXD CER 0.001 UF 600VDCW | |
| A1C36 | 0150-0050 | C:FXD CER 0.001 UF 600VDCW | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | hp Stock No. | Description # | Note |
|-----------------------|--------------|-------------------------------|------|
| ALCR1 | 1901-0179 | DIODE:SILICON 15WV | |
| ALCR2 | 1901-0179 | DIODE:SILICON 15WV | |
| ALCR3 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| ALCR4 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| ALCR5 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| ALCR6 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| ALCR7 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| ALCR8 | 1902-0062 | DIODE BREAKDOWN:3.47V | |
| ALCR9 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| ALCR10 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| ALL1 | 9140-0158 | COIL:FXD RF 1 UH 10% | |
| ALL2 | 05255-6032 | COIL ASSY.- VIDEO AMP. | |
| ALL3 | 05255-6032 | COIL ASSY.- VIDEO AMP. | |
| ALL4 | 9140-0144 | COIL:FXD RF 4.7 MH 10% | |
| ALL5 | 05255-6020 | COIL ASSY.- VIDEO AMP. | |
| ALL6 | 05255-6020 | COIL ASSY.- VIDEO AMP. | |
| ALL7 | 05255-6020 | COIL ASSY.- VIDEO AMP. | |
| ALQ1 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ2 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ3 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ4 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ5 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ6 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ7 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ8 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ9 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ10 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ11 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ12 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| ALQ13 | 1853-0018 | TRANSISTOR:SILICON PNP | |
| ALQ14 | 1854-0073 | TRANSISTOR:SILICON NPN | |
| ALQ15 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| ALQ16 | 1854-0003 | TRANSISTOR:SILICON NPN | |
| ALR1 | 0698-3380 | R:FXD CARBON 75 OHM 5% 1/8W | |
| ALR2 | 0698-5567 | R:FXD CARBON 27K OHM 5% 1/8W | |
| ALR3 | 0698-5568 | R:FXD CARBON 36K OHM 5% 1/8W | |
| ALR4 | 0698-5562 | R:FXD CARBON 120 OHM 5% 1/8W | |
| ALR5 | 0698-3374 | R:FXD CARBON 20 OHM 5% 1/8W | |
| ALR6 | 0757-0917 | R:FXD MET FLM 510 OHM 2% 1/8W | |
| ALR7 | 0698-3381 | R:FXD CARBON 150 OHM 5% 1/8W | |
| ALR8 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| ALR9 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| ALR10 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| ALR11 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| ALR12 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| ALR13 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| ALR14 | 0674-3315 | R:FXD CARBON 330 OHM 5% 1/8W | |
| ALR15 | 0698-5563 | R:FXD CARBON 180 OHM 5% 1/8W | |
| ALR16 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------|--|------|
| AlR17 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR18 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR19 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR20 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR21 | 0698-5563 | R:FXD CARBON 180 OHM 5% 1/8W | |
| AlR22 | 0698-5563 | R:FXD CARBON 180 OHM 5% 1/8W | |
| AlR23 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR24 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR25 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR26 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR27 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR28 | 0698-5175 | R:FXD CARBON 360 OHM 5% 1/8W FACTORY SELECTED PART, TYPICAL VALUE GIVEN | |
| AlR29 | 0698-5563 | R:FXD CARBON 180 OHM 5% 1/8W | |
| AlR30 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR31 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR32 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR33 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR34 | 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | |
| AlR35 | 0698-5174 | R:FXD COMP 200 OHM 5% 1/8W | |
| AlR36 | 0698-5564 | R:FXD CARBON 240 OHM 5% 1/8W | |
| AlR37 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR38 | 0698-5172 | R:FXD COMP 13 OHM 5% 1/8W | |
| AlR39 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| AlR40 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR41 | 0698-5172 | R:FXD COMP 13 OHM 5% 1/8W | |
| AlR42 | 0698-3381 | R:FXD CARBON 150 OHM 5% 1/8W | |
| AlR43 | 0698-5182 | R:FXD COMP 3.9K OHM 5% 1/8W | |
| AlR44 | 0698-5565 | R:FXD CARBON 2.2K OHM 5% 1/8W | |
| AlR45 | 0698-3374 | R:FXD CARBON 20 OHM 5% 1/8W | |
| AlR46 | 0698-5180 | R:FXD COMP 2K OHM 5% 1/8W | |
| AlR47 | 0698-5566 | R:FXD COMP 2.4K OHM 5% 1/8W FACTORY SELECTED PART, TYPICAL VALUE GIVEN | |
| AlR48 | 0698-5562 | R:FXD CARBON 120 OHM 5% 1/8W | |
| AlR49 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| AlR50 | 0698-3113 | R:FXD CARBON 100 OHM 5% 1/8W | |
| AlR51 | 0698-3113 | R:FXD CARBON 100 OHM 5% 1/8W | |
| AlR52 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR53 | 0698-5103 | R:FXD COMP 430 OHM 5% 1/8W | |
| AlR54 | 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | |
| AlR55 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| AlR56 | 0698-5562 | R:FXD CARBON 120 OHM 5% 1/8W | |
| AlR57 | 0698-3380 | R:FXD CARBON 75 OHM 5% 1/8W | |
| AlR58 | 0698-5185 | R:FXD COMP 15K OHM 5% 1/8W | |
| AlR59 | 2100-0898 | R:VAR WW 500 OHM 5% | |
| AlR60 | 0675-1021 | R:FXD CARBON 1K OHM 10% 1/8W | |
| AlR61 | 0698-5184 | R:FXD COMP 6.2K OHM 5% 1/8W | |
| AlR62 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| AlR63 | 0698-3113 | R:FXD CARBON 100 OHM 5% 1/8W | |
| AlR64 | 0698-3114 | R:FXD CARBON 300 OHM 5% 1/8W | |
| AlR65 | 0698-5185 | R:FXD COMP 15K OHM 5% 1/8W | |
| AlR66 | 0698-5181 | R:FXD COMP 3.6K OHM 5% 1/8W | |
| AlR67 | 0698-5179 | R:FXD COMP 1.8K OHM 5% 1/8W | |
| AlT1 | 05255-6021 | TRANSFORMER:VIDEO AMP. | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------|------------------------------------|------|
| A7 | 05255-6028 | VIDEO AMPLIFIER ASSY | |
| A7C1,2,3 | 0160-0204 | C:FXD CER FEED THRU FILTER NETWORK | |
| A7J1 THRU J3 | | NOT ASSIGNED | |
| A7J4 | 1250-0829 | CONNECTOR:RF | |
| A7J5 | 1250-0830 | CONNECTOR:RF | |
| A7J6 | | NOT ASSIGNED | |
| A7J7,8 | 1250-0829 | CONNECTOR:RF | |
| A7J9 | 1250-0830 | CONNECTOR:RF | |
| A8 | 05255-6006 | BOARD ASSY.- PRESCALER | |
| A | 05255-2006 | BOARD- BLANK | |
| A8C1 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C2 | 0140-0193 | C:FXD MICA 82 PF 5% | |
| A8C3 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C4 | 0180-0230 | C:FXD ELECT 1 UF 20% 50VDCW | |
| A8C5 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C6 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C7 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C8 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C9 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C10 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C11 | 0150-0035 | C:FXD CER 20 PF 10% 600VDCW | |
| A8C12 | 0140-0152 | C:FXD MICA 1000 PF 5% 300VDCW | |
| A8C13 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C14 | 0150-0061 | C:FXD CER 20 PF 10% 100VDCW | |
| A8C15 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C16 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C17 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C18 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C19 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A8C20 | 0180-0116 | C:FXD ELECT 6.8 UF 10% 35VDCW | |
| A8C21 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8C22 | 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | |
| A8CR1 | 1912-0012 | DIODE:GERMANIUM TUNNEL | |
| A8CR2 | 1902-3079 | DIODE:ZENER 4V | |
| A8CR3 | 1902-3079 | DIODE:ZENER 4V | |
| A8CR4 | 1902-3079 | DIODE:ZENER 4V | |
| A8CR5 | 1902-3079 | DIODE:ZENER 4V | |
| A8L1 | 8180-0224 | WIRE:#24 1.6 LONG | |
| A8L1 | 0890-0048 | SLEEVE:TEFLON 1.3 LONG | |
| A8L2 | 9100-0346 | COIL:FXD 0.05 UH 20% | |
| A8L3 | 9100-1724 | COIL:FXD 0.22 UH 10% | |
| A8L4 | 8180-0224 | WIRE:#24 1.6 LONG | |
| A8L4 | 0890-0048 | SLEEVE:TEFLON 1.3 LONG | |
| A8L5 | 8180-0224 | WIRE:#24 1.6 LONG | |
| A8L5 | 0890-0048 | SLEEVE:TEFLON 1.3 LONG | |
| A8L6 | 9100-0368 | COIL:FXD 0.33 UH 10% | |
| A8L7 | 8180-0224 | WIRE:#24 1.6 LONG | |
| A8L7 | 0890-0048 | SLEEVE:TEFLON 1.3 LONG | |
| A8L8 | 8180-0224 | WIRE:#24 1.6 LONG | |
| A8L8 | 0890-0048 | SLEEVE:TEFLON 1.3 LONG | |
| A8Q1 | 1854-0073 | TRANSISTOR:SILICON NPN | |
| A8Q2 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| A8Q3 | 1854-0073 | TRANSISTOR:SILICON NPN | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|---|-----------|---|------|
| A8Q4 | 1853-0054 | TRANSISTOR:SILICON PNP | |
| A8Q5 | 1853-0054 | TRANSISTOR:SILICON PNP | |
| A8Q6 | 1854-0019 | TRANSISTOR:SILICON NPN | |
| A8Q7 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| A8Q8 | 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | |
| A8Q9 | 1854-0019 | TRANSISTOR:SILICON NPN | |
| A8Q10 | 1853-0015 | TRANSISTOR:SILICON PNP 2N3640 | |
| A8Q11 | 1853-0015 | TRANSISTOR:SILICON PNP 2N3640 | |
| A8Q12 | 1854-0073 | TRANSISTOR:SILICON NPN | |
| A8Q13 | 1854-0073 | TRANSISTOR:SILICON NPN | |
| A8Q14 | 1854-0019 | TRANSISTOR:SILICON NPN | |
| A8Q15 | 1854-0019 | TRANSISTOR:SILICON NPN | |
| A8Q16 | 1853-0009 | TRANSISTOR:SILICON PNP | |
| A8Q17 | 1853-0009 | TRANSISTOR:SILICON PNP | |
| A8Q18 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A8Q19 | 1854-0003 | TRANSISTOR:SILICON NPN | |
| A8Q20 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A8R1 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| A8R2 | 0757-0939 | R:FXD MET FLM 4.3K OHM 2% 1/8W FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |
| A8R3 | 0698-3381 | R:FXD CARBON 150 OHM 5% 1/8W | |
| A8R4 | 0698-5173 | R:FXD COMP 36 OHM 5% 1/8W | |
| A8R5 | 0698-3111 | R:FXD COMP 30 OHM 5% 1/8W | |
| A8R6 | 0757-0931 | R:FXD MET FLM 2K OHM 2% 1/8W | |
| A8R7 | 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | |
| A8R8 | 0757-0926 | R:FXD MET FLM 1.2K OHM 2% 1/8W | * |
| A8R9 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| A8R10 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A8R11 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| A8R12 | 0757-0922 | R:FXD MET FLM 820 OHM 2% 1/8W | |
| A8R13 | 0698-3113 | R:FXD CARBON 100 OHM 5% 1/8W | |
| A8R14 | 0757-0923 | R:FXD MET FLM 910 OHM 2% 1/8W | |
| A8R15 | 0698-3376 | R:FXD COMP 43 OHM 5% 1/8W | |
| A8R16 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | |
| A8R17 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| A8R18 | 0757-0923 | R:FXD MET FLM 910 OHM 2% 1/8W | |
| A8R19 | 0698-3376 | R:FXD COMP 43 OHM 5% 1/8W | |
| A8R20 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | |
| A8R21 | 0698-3381 | R:FXD CARBON 150 OHM 5% 1/8W | |
| A8R22 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | * |
| A8R23 | 0698-3380 | R:FXD CARBON 75 OHM 5% 1/8W | |
| A8R24 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A8R25 | 0757-0923 | R:FXD MET FLM 910 OHM 2% 1/8W | |
| A8R26 | 0757-0893 | R:FXD MET FLM 51 OHM 2% 1/8W | |
| A8R27 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | |
| A8R28 | 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | |
| A8R29 | 0757-0923 | R:FXD MET FLM 910 OHM 2% 1/8W | |
| A8R30 | 0757-0893 | R:FXD MET FLM 51 OHM 2% 1/8W | |
| A8R31 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | |
| A8R32 | 0757-0904 | R:FXD MET FLM 150 OHM 2% 1/8W | |
| * FACTORY SELECTED PART;TYPICAL VALUE GIVEN | | | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|--------------------------|------------------------------------|------|
| A8R33 | 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | |
| A8R34 | 0757-0909 | R:FXD MET FLM 240 OHM 2% 1/8W | |
| A8R35 | 0683-1005 | R:FXD COMP 10 OHM 5% 1/4W | |
| A8R36 | 0757-0909 | R:FXD MET FLM 240 OHM 2% 1/8W | |
| A8R37 | 0757-0904 | R:FXD MET FLM 150 OHM 2% 1/8W | |
| A8R38 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A8R39 | 0757-0942 | R:FXD MET FLM 5.6K OHM 2% 1/8W | |
| A8R40 | 0757-0941 | R:FXD MET FLM 5.1K OHM 2% 1/8W | |
| A8R41 | 0757-0931 | R:FXD MET FLM 2K OHM 2% 1/8W | |
| A8R42 | 0757-0945 | R:FXD MET FLM 7.5K OHM 2% 1/8W | |
| A9 | 05255-6005 05255-2005 | ASSY:CONTROL BOARD BOARD- BLANK | |
| A9C1 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A9C2 | 0150-0050 | C:FXD CER 0.001 UF 600VDCW | |
| A9C3 | 0150-0050 | C:FXD CER 0.001 UF 600VDCW | |
| A9C4 | 0121-0061 | C:VAR CER 5.5-18 PF | |
| A9C5 | 0180-0291 | C:FXD ELECT 1.0 UF 10% 35VDCW | |
| A9C6 | 0170-0055 | C:FXD MY 0.1 UF 20% 200VDCW | |
| A9C7 | 0180-0116 | C:FXD ELECT 6.8 UF 10% 35VDCW | |
| A9C8 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A9C9 | 0170-0024 | C:FXD MY 0.022 UF 20% 200VDCW | |
| A9C10 | 0180-0229 | C:FXD ELECT 33 UF 10% 10VDCW | |
| A9CR1 | 1901-0347 | DIODE:SILICON | |
| A9CR2 | 1901-0347 | DIODE:SILICON | |
| A9CR3 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A9CR4 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A9CR5 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A9CR6 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A9L1 | 9100-0346 | COIL:FXD 0.05 UH 20% | |
| A9L2 | 9100-0346 | COIL:FXD 0.05 UH 20% | |
| A9Q1 | 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | |
| A9Q2 | 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | |
| A9Q3 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A9Q4 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A9Q5 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q6 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q7 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q8 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q9 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q10 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q11 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9Q12 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A9Q13 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A9R1 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A9R2 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A9R3 | 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | |
| A9R4 | 2100-0969 | R:VAR MET FLM 50K OHM 20% | |
| A9R5 | 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | |
| A9R6 | 0683-2745 | R:FXD COMP 270K OHM 5% 1/4W | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------|---|------|
| A9R7 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A9R8 | 0757-0952 | R:FXD MET FLM 15K OHM 2% 1/8W | |
| A9R9 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A9R10 | 0683-2745 | R:FXD COMP 270K OHM 5% 1/4W | |
| A9R11 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R12 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R13 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A9R14 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A9R15 | 0757-0951 | R:FXD MET FLM 13K OHM 2% 1/8W | |
| A9R16 | 0683-1005 | R:FXD COMP 10 OHM 5% 1/4W | |
| A9R17 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R18 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| A9R19 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R20 | 0757-0938 | R:FXD MET FLM 3.9K OHM 2% 1/8W | |
| A9R21 | 0757-0962 | R:FXD MET FLM 39K OHM 2% 1/8W | |
| A9R22 | 0757-0950 | R:FXD MET FLM 12K OHM 2% 1/8W | |
| A9R23 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R24 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R25 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A9R26 | 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | |
| A9R27 | 0683-4745 | R:FXD COMP 470K OHM 5% 1/4W | |
| A9R28 | 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | |
| A9R29 | 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | |
| A10 | 05255-6007 | BOARD ASSY.- GATE TIME EXTENDER | |
| A10 | 05255-2007 | BOARD- BLANK | |
| A10C1 | 0140-0152 | C:FXD MICA 1000 PF 5% 300VDCW | |
| A10C2 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A10C3 | 0180-0195 | C:FXD ELECT 0.33 UF 20% 35VDCW | |
| A10C4 | 0140-0202 | C:FXD MICA 15 PF 5% | * |
| A10C5 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A10C6 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C7 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C8 | 0140-0202 | C:FXD MICA 15 PF 5% | * |
| A10C9 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C10 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C11 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A10C12 | 0140-0145 | C:FXD MICA 22 PF 5% | |
| A10C13 | 0140-0204 | C:FXD MICA 47 PF 5% | * |
| | | FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |
| A10C14 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C15 | 0140-0203 | C:FXD MICA 30 PF 5% | |
| A10C16 | 0140-0204 | C:FXD MICA 47 PF 5% | * |
| | | FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |
| A10CR1 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A10CR2 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR3 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR4 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR5 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR6 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| | | * FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|-----------|--------------------------------|------|
| A10CR7 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR8 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A10CR9 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A10CR10 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR11 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR12 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR13 | 1910-0016 | DIODE:GERMANIUM 60 WIV | |
| A10CR14 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10CR15 | 1901-0040 | DIODE:SILICON 30 WV 30MA | |
| A10L1 | 9140-0105 | COIL:MOLDED CHOKE 8.20 UH 10% | |
| A10L2 | 9140-0105 | COIL:MOLDED CHOKE 8.20 UH 10% | |
| A10Q1 | 1850-0062 | TRANSISTOR:SILICON | |
| A10Q2 | 1850-0062 | TRANSISTOR:SILICON | |
| A10Q3 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q4 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q5 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q6 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q7 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q8 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A10Q9 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q10 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q11 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A10Q12 | 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | |
| A10R1 | 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | |
| A10R2 | 0757-0926 | R:FXD MET FLM 1.2K OHM 2% 1/8W | |
| A10R3 | 0757-0972 | R:FXD MET FLM 100K OHM 2% 1/8W | |
| A10R4 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R5 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R6 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R7 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R8 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R9 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R10 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R11 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R12 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R13 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R14 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R15 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R16 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R17 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R18 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R19 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R20 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R21 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R22 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R23 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R24 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R25 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R26 | 0757-0912 | R:FXD MET FLM 330 OHM 2% 1/8W | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------|---|------|
| A10R27 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| A10R28 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A10R29 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R30 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R31 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R32 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R33 | 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | |
| A10R34 | 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | |
| A10R35 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R36 | 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | |
| A10R37 | 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | |
| A10R38 | 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | |
| A10R39 | 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | |
| A10R40 | 0757-0912 | R:FXD MET FLM 330 OHM 2% 1/8W | |
| A10R41 | 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | |
| C1 | THRU | C:FXD CER FEED THRU FILTER 200VDCW | |
| C11 | | | |
| J1 | 1250-0745 | CONNECTOR:RF GPC-7 | |
| J2 | 1250-0102 | CONNECTOR:BNC | |
| J3 | 1250-0102 | CONNECTOR:BNC | |
| M1 | 1120-0140 | METER | |
| MP1 | 05255-6027 | DRIVE ASSY.- GEAR INCL MP2 THRU MP16 | |
| MP2 | 1410-0015 | BEARING:BALL | |
| MP3 | 1410-0088 | BUSHING:1/4 DIA | |
| MP4 | 1410-0141 | BUSHING:SLEEVE 3/16 DIA | |
| MP5 | 1480-0028 | PIN:DOWEL | |
| MP6 | 1480-0208 | PIN:GROOVE | |
| MP7 | 3050-0381 | WASHER:THRUST(DELFIN) | |
| MP8 | 05254-2031 | GEAR- DRIVER | |
| MP9 | 05254-2032 | GEAR- DIAL TRAIN #1 | |
| MP10 | 05254-2033 | GEAR- DIAL TRAIN #2 | |
| MP11 | 05255-0013 | PLATE- BOTTOM | |
| MP12 | 05255-2031 | MOUNT GEAR | |
| MP13 | 05255-2032 | SHAFT- TRANSFER | |
| MP14 | 05255-2033 | SHAFT- INPUT | |
| MP15 | 05255-2039 | GEAR- DRIVE PINION | |
| MP16 | 05255-2040 | GEAR-DRIVEN PINION | |
| MP17 | 05255-2041 | GEAR- DRIVER STOP | |
| MP18 | 05255-2042 | GEAR- OFFSET STOP | |
| MP19 | 05255-2044 | SHAFT- IDLER GEAR | |
| MP20 | 05255-2054 | GEAR- DIAL DRIVE | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|------------|--|------|
| MP21 | 05255-4003 | MOUNT- DIAL BUSHING | |
| MP22 | 05255-6010 | GEAR ASSY. #1- ANTI-BACKLASH INCL MP64-MP68 | |
| MP23 | 05255-6011 | GEAR ASSY. #2- ANTI-BACKLASH INCL MP64,65,68THRU 70 | |
| MP24 | 05255-6012 | DRIVE ASSY.- PROBE INCL MP27 THRU MP41 | |
| MP25 | 05255-6013 | CAVITY ASSY.- MIXER INCL MP42 THRU MP63 | |
| MP26 | 05255-6034 | PANEL ASSY.- FRONT | |
| MP27 | 1410-0729 | BEARING:DUPLEXED BALL P/O MP24 | |
| MP28 | 1460-0036 | SPRING:COMPRESSION P/O MP24 | |
| MP29 | 1460-0702 | SPRING:ANTI-BACKLASH(COIL) P/O MP24 | |
| MP30 | 05255-0014 | PLATE- DRIVE COVER P/O MP24 | |
| MP31 | 05255-0015 | PLATE- SPRING PRESSURE P/O MP24 | |
| MP32 | 05255-2021 | SCREW-PROBE DRIVE LEAD P/O MP24 | |
| MP33 | 05255-2022 | NUT- PROBE DRIVE LEAD P/O MP24 | |
| MP34 | 05255-2025 | NUT- INNER RING LOCK P/O MP24 | |
| MP35 | 05255-2026 | HOUSING- PROBE DRIVE BEARING P/O MP24 | |
| MP36 | 05255-2027 | SCREW OUTER RING LOCK P/O MP24 | |
| MP37 | 05255-2028 | HOUSING- PROBE DRIVE P/O MP24 | |
| MP38 | 05255-2051 | PLUG- TEFLON P/O MP24 | |
| MP39 | 05255-2053 | BUSHING-TEFLON P/O MP24 | |
| MP40 | 05255-6014 | BACK CAVITY AND FINGER ASSY. P/O MP24 | |
| MP41 | 05255-6029 | SLIDER ASSY.- PROBE P/O MP24 | |
| MP42 | 3050-0159 | WASHER:NYLON #6 P/O MP25 | |
| MP43 | 1250-0815 | INSULATOR:RF CONNECTOR P/O MP25 | |
| MP44 | 1460-0268 | SPRING:COMPRESSION P/O MP25 | |
| MP45 | 1460-0297 | SPRING:COMPRESSION P/O MP25 | |
| MP46 | 1901-0480 | DIODE:SILICON HOT CARRIER(USD) P/O MP25 | |
| MP47 | 1901-0481 | DIODE:SILICON HOT CARRIER(RSU) P/O MP25 | |
| MP48 | 5020-3247 | BODY:FEMALE P/O MP25 | |
| MP49 | 5020-3249 | PIN:FEMALE P/O MP25 | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|-----------------------|--------------|---|------|
| MP50 | 08491-2002 | BEAD | |
| MP51 | 0520-3296 | P/O MP25 CONDUCTOR: CENTER CARTRIDGE ADAPT | |
| MP52 | 0520-3297 | P/O MP25 CONTACT: SLIDING | |
| MP53 | 05255-0001 | P/O MP25 COVER- MIXER | |
| MP54 | 05255-0017 | P/O MP25 SPRING: CONTACT | |
| MP55 | 05255-2011 | P/O MP25 CONDUCTOR- CENTER REAR | |
| MP56 | 05255-2014 | P/O MP25 BODY - MIXER CAVITY | |
| MP57 | 05255-2015 | P/O MP25 END- FRONT | |
| MP58 | 05255-2020 | P/O MP25 CONTACT- SLIDING REAR | |
| MP59 | 05255-4006 | P/O MP25 RETAINER- SPRING | |
| MP60 | | CABLE ASSY.- (+) INPUT | |
| MP61 | | P/O A6W1 CABLE ASSY.- (-) INPUT | |
| MP62 | 05255-6031 | P/O A6W2 ATTENUATOR ASSY.- | |
| MP63 | 05255-6035 | P/O MP25 HOLDER ASSY.- DIODE | |
| MP64 | 107A-69A-16H | P/O MP25 STUD- SHORT | |
| MP65 | 107A-69A-16J | P/O MP22 AND MP23 STUD- LONG | |
| MP66 | 05255-2035 | GEAR #1- FXD | |
| MP67 | 05255-2036 | P/O MP22 GEAR #1- ANTI-BACKLASH | |
| MP68 | 05255-2060 | P/O MP22 SPRING-ANTI-BACKLASH | |
| MP69 | 05255-2037 | P/O MP22 AND MP23 GEAR #2- FIXED | |
| MP70 | 05255-2038 | P/O MP23 GEAR #2- ANTI-BACKLASH | |
| MP71 | 3030-0057 | SCREW: STL SOCKET DR 2-56 X 3/32 | |
| MP72 | 3030-0013 | SCREW: STL SOCKET CAP 6-32 X 3/4 | |
| MP73 | 3030-0007 | SCREW: STL SET 4-40 X 0.125 | |
| MP74 | 0520-0009 | SCREW: BRS FH 2-56 X 1/4 | |
| MP75 | 0520-0024 | SCREW: SST BH 2-56 X 0.188 | |
| MP76 | 0520-0003 | SCREW: SST RH 2-56 X 3/8 | |
| MP77 | 2360-0018 | SCREW: SST RH 6-32 X 1-1/2 | |
| MP78 | 0510-0054 | RING: GRIP FOR 1/4 SHAFT | |
| MP79 | 3020-0004 | SCREW: STL SOCKET CAP 1/4-20 X 3/ | |
| MP80 | 3050-0028 | WASHER: BRS 7/16 X 1/4 | |
| MP81 | 3030-0022 | SCREW: STL SET 6-32 X 1/8W | |
| MP82 | 2360-0019 | SCREW: SST RH 6-32 X 1-3/4 | |
| MP83 | 0520-0024 | SCREW: SST BH 2-56 X 0.188 | |
| MP84 | 3050-0100 | WASHER: FLAT BRS FOR #6 SCREW | |

See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | Stock No. | Description # | Note |
|--|--|--|------|
| MP85 MP86 MP87 | 3030-0001 0370-0275 0370-0050 | SCREW:SET STL 8-32 X 3/16" KNOB:CRANK BLK 1" DIA KNOB:ROUND BLK 3/8" DIA | |
| P1 THRU P3 P4 P5 P6 P7 THRU | 1250-0821 1250-0821 1251-0099 | NOT ASSIGNED CONNECTOR:RF PART OF W4 CONNECTOR:RF PART OF W5 CONNECTOR:RF 50 PIN PART OF W1 | |
| P8 P9 P10 | 1250-0821 1250-0821 | NOT ASSIGNED CONNECTOR:RF PART OF W2 CONNECTOR:RF PART OF W1 | |
| W1 W2 W3 W4 W5 | 05255-6033 05255-6026 05255-6026 05255-6018 05255-6017 | MAIN CABLE ASSY:INCLUDES P6 PRESCALER INPUT CABLE ASSY:INCLUDES P9 HARM. GEN. INPUT CABLE ASSY:INCLUDES P10 AUX. INPUT CABLE ASSY:INCLUDES P4 AUX. OUTPUT CABLE ASSY:INCLUDES P5 | |
| XA1 THRU XA4 XA5 THRU XA7 | 1251-0076 | CONNECTOR:30 PIN MALE NOT ASSIGNED | |
| XA8,9 XA10 | 1251-0076 1251-0135 | CONNECTOR:30 PIN MALE CONNECTOR:BODY 15 PIN | |

See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|-----------|------------------------------------|-------|-------------------|----|
| 0121-0037 | C:VAR CER 7-25 PF | 28480 | 0121-0037 | 5 |
| 0121-0060 | C:VAR CER 2-8 PF | 28480 | 0121-0060 | 1 |
| 0121-0061 | C:VAR CER 5.5-18 PF | 28480 | 0121-0061 | 9 |
| 0122-0006 | C:VAR 100 PF 20% 20WV | 01281 | 1N4815 | 2 |
| 0131-0004 | C:VAR MICA 16-150 PF 175VDCW | 28480 | 0131-0004 | 1 |
| 0131-0006 | C:VAR MICA 70-350 PF 175VDCW | 28480 | 0131-0006 | 1 |
| 0140-0145 | C:FXD MICA 22 PF 5% | 28480 | 0140-0145 | 5 |
| 0140-0152 | C:FXD MICA 1000 PF 5% 300VDCW | 04062 | DM16F102J | 4 |
| 0140-0176 | C:FXD MICA 100 PF 2% | 28480 | 0140-0176 | 2 |
| 0140-0192 | C:FXD MICA 68 PF 5% | 28480 | 0140-0192 | 1 |
| 0140-0193 | C:FXD MICA 82 PF 5% | 28480 | 0140-0193 | 1 |
| 0140-0201 | C:FXD MICA 12 PF 5% | 28480 | 0140-0201 | 1 |
| 0140-0202 | C:FXD MICA 15 PF 5% | 28480 | 0140-0202 | 2 |
| 0140-0203 | C:FXD MICA 30 PF 5% | 28480 | 0140-0203 | 6 |
| 0140-0204 | C:FXD MICA 47 PF 5% | 28480 | 0140-0204 | 2 |
| 0140-0207 | C:FXD MICA 330 PF 5% | 28480 | 0140-0207 | 1 |
| 0140-0209 | C:FXD MICA 5.0 PF 10% | 28480 | 0140-0209 | 3 |
| 0150-0035 | C:FXD CER 20 PF 10% 600VDCW | 71590 | TYPE DD200 | 1 |
| 0150-0050 | C:FXD CER 0.001 UF 600VDCW | 84411 | 0BD | 7 |
| 0150-0059 | C:FXD CER 3.3/.25 PF 600VDCW | 72982 | 301-000-C0J0-339C | 2 |
| 0150-0061 | C:FXD CER 20 PF 10% 100VDCW | 56289 | 53C47 | 1 |
| 0150-0088 | C:FXD CER 3.9/0.25 PF 500VDCW | 28480 | 0150-0088 | 2 |
| 0150-0091 | C:FXD CER 1.5/0.25 PF 500VDCW | 28480 | 0150-0091 | 4 |
| 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | 91418 | TA | 37 |
| 0160-0157 | C:FXD MY 0.0047 UF 10% 200VDCW | 28480 | 0160-0157 | 1 |
| 0160-0161 | C:FXD MY 0.01 UF 10% 200VDCW | 28480 | 0160-0161 | 2 |
| 0160-0179 | C:FXD MICA 33 PF 5% | 28480 | 0160-0179 | 2 |
| 0160-0204 | C:FXD CER FEED THRU FILTER 200VDCW | 01121 | SMFB-A2 | 13 |
| 0160-0205 | C:FXD MICA 10 PF 5% | 28480 | 0160-0205 | 1 |
| 0160-2327 | C:FXD CER 1000 PF 20% 75VDCW | 28480 | 0160-2327 | 10 |
| 0160-2356 | C:FXD CER 6800 PF 20% 200VDCW | 95275 | VK338W682M | 12 |
| 0170-0024 | C:FXD MY 0.022 UF 20% 200VDCW | 28480 | 0170-0024 | 1 |
| 0170-0055 | C:FXD MY 0.1 UF 20% 200VDCW | 28480 | 0170-0055 | 3 |
| 0180-0101 | C:FXD ELECT 1.8 UF 10% 35VDCW | 56289 | 150D185X9035B2 | 1 |
| 0180-0116 | C:FXD ELECT 6.8 UF 10% 35VDCW | 56289 | 150D685X9035B2 | 2 |
| 0180-0155 | C:FXD ELECT 2.2 PF 20% 20VDCW | 56289 | 150D225X0020A2 | 1 |
| 0180-0195 | C:FXD ELECT 0.33 UF 20% 35VDCW | 56289 | 150D334X0035A2 | 1 |
| 0180-0218 | C:FXD ELECT .15 UF 10% 35VDCW | 56289 | 150D154X9035A2 | 3 |
| 0180-0229 | C:FXD ELECT 33 UF 10% 10VDCW | 56289 | 150D336X9010B2 | 1 |
| 0180-0230 | C:FXD ELECT 1 UF 20% 50VDCW | 56289 | 150D105X0050A2 | 10 |
| 0180-0291 | C:FXD ELECT 1 UF 10% 35VDCW | 56289 | 150D105X9035A2 | 2 |
| 0370-0050 | KNOB:ROUND BLK 3/8" DIA | 28480 | 0370-0050 | 1 |
| 0370-0275 | KNOB:CRANK BLK 1" DIA | 28480 | 0370-0275 | 1 |
| 0410-0130 | CRYSTAL:QUARTZ 10 MHZ | 28480 | 0410-0130 | 1 |
| 0510-0054 | RING:GRIP FOR 1/4 SHAFT | 79136 | 5555-25MD | 1 |
| 0520-0003 | SCREW:SST RH 2-56 X 3/8 | 28480 | 0520-0003 | 1 |
| 0520-0009 | SCREW:BRS FH 2-56 X 1/4 | 28480 | 0520-0009 | 1 |
| 0520-0024 | SCREW:SST BH 2-56 X 0.188 | 28480 | 0520-0024 | 2 |
| 0520-3296 | CONDUCTOR:CENTER CARTRIDGE ADAPT | 28480 | 0520-3296 | 1 |

* See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|-----------|--------------------------------|-------|---------------|----|
| 0520-3297 | CONTACT:SLIDING | 28480 | 0520-3297 | 1 |
| 0674-3315 | R:FXD CARBON 330 OHM 5% 1/8W | 28480 | 0674-3315 | 1 |
| 0675-1021 | R:FXD CARBON 1K OHM 10% 1/8W | 28480 | 0675-1021 | 1 |
| 0683-1005 | R:FXD COMP 10 OHM 5% 1/4W | 01121 | CB 1005 | 2 |
| 0683-2745 | R:FXD COMP 270K OHM 5% 1/4W | 01121 | CB 2745 | 2 |
| 0683-4745 | R:FXD COMP 470K OHM 5% 1/4W | 01121 | CB 4745 | 1 |
| 0698-3111 | R:FXD COMP 30 OHM 5% 1/8W | 28480 | 0698-3111 | 1 |
| 0698-3113 | R:FXD CARBON 100 OHM 5% 1/8W | 28480 | 0698-3113 | 4 |
| 0698-3114 | R:FXD CARBON 300 OHM 5% 1/8W | 28480 | 0698-3114 | 1 |
| 0698-3374 | R:FXD CARBON 20 OHM 5% 1/8W | 28480 | 0698-3374 | 2 |
| 0698-3376 | R:FXD COMP 43 OHM 5% 1/8W | 28480 | 0698-3376 | 2 |
| 0698-3378 | R:FXD CARBON 51 OHM 5% 1/8W | 28480 | 0698-3378 | 7 |
| 0698-3380 | R:FXD CARBON 75 OHM 5% 1/8W | 28480 | 0698-3380 | 3 |
| 0698-3381 | R:FXD CARBON 150 OHM 5% 1/8W | 28480 | 0698-3381 | 4 |
| 0698-5103 | R:FXD COMP 430 OHM 5% 1/8W | 28480 | 0698-5103 | 1 |
| 0698-5172 | R:FXD COMP 13 OHM 5% 1/8W | 28480 | 0698-5172 | 2 |
| 0698-5173 | R:FXD COMP 36 OHM 5% 1/8W | 28480 | 0698-5173 | 1 |
| 0698-5174 | R:FXD COMP 200 OHM 5% 1/8W | 28480 | 0698-5174 | 1 |
| 0698-5175 | R:FXD CARBON 360 OHM 5% 1/8W | 28480 | 0698-5175 | 1 |
| 0698-5177 | R:FXD COMP 820 OHM 5% 1/8W | 28480 | 0698-5177 | 7 |
| 0698-5178 | R:FXD COMP 1.5K OHM 5% 1/8W | 28480 | 0698-5178 | 12 |
| 0698-5179 | R:FXD COMP 1.8K OHM 5% 1/8W | 28480 | 0698-5179 | 1 |
| 0698-5180 | R:FXD COMP 2K OHM 5% 1/8W | 28480 | 0698-5180 | 1 |
| 0698-5181 | R:FXD COMP 3.6K OHM 5% 1/8W | 28480 | 0698-5181 | 1 |
| 0698-5182 | R:FXD COMP 3.9K OHM 5% 1/8W | 28480 | 0698-5182 | 1 |
| 0698-5184 | R:FXD COMP 6.2K OHM 5% 1/8W | 28480 | 0698-5184 | 1 |
| 0698-5185 | R:FXD COMP 15K OHM 5% 1/8W | 28480 | 0698-5185 | 2 |
| 0698-5561 | R:FXD COMP 6.8 OHM 5% 1/8W | 28480 | 0698-5561 | 8 |
| 0698-5562 | R:FXD CARBON 120 OHM 5% 1/8W | 28480 | 0698-5562 | 3 |
| 0698-5563 | R:FXD CARBON 180 OHM 5% 1/8W | 28480 | 0698-5563 | 4 |
| 0698-5564 | R:FXD CARBON 240 OHM 5% 1/8W | 28480 | 0698-5564 | 1 |
| 0698-5565 | R:FXD CARBON 2.2K OHM 5% 1/8W | 28480 | 0698-5565 | 1 |
| 0698-5566 | R:FXD COMP 2.4K OHM 5% 1/8W | 28480 | 0698-5566 | 1 |
| 0698-5567 | R:FXD CARBON 27K OHM 5% 1/8W | 28480 | 0698-5567 | 1 |
| 0698-5568 | R:FXD CARBON 36K OHM 5% 1/8W | 28480 | 0698-5568 | 1 |
| 0757-0379 | R:FXD MET FLM 12.1 OHM 2% 1/8W | 28480 | 0757-0379 | 1 |
| 0757-0387 | R:FXD MET FLM 27.4 OHM 2% 1/8W | 28480 | 0757-0387 | 1 |
| 0757-0893 | R:FXD MET FLM 51 OHM 2% 1/8W | 28480 | 0757-0893 | 2 |
| 0757-0900 | R:FXD MET FLM 100 OHM 2% 1/8W | 28480 | 0757-0900 | 9 |
| 0757-0904 | R:FXD MET FLM 150 OHM 2% 1/8W | 28480 | 0757-0904 | 2 |
| 0757-0905 | R:FXD MET FLM 160 OHM 2% 1/8W | 28480 | 0757-0905 | 1 |
| 0757-0909 | R:FXD MET FLM 240 OHM 2% 1/8W | 28480 | 0757-0909 | 2 |
| 0757-0910 | R:FXD MET FLM 270 OHM 2% 1/8W | 28480 | 0757-0910 | 1 |
| 0757-0912 | R:FXD MET FLM 330 OHM 2% 1/8W | 28480 | 0757-0912 | 3 |
| 0757-0915 | R:FXD MET FLM 430 OHM 2% 1/8W | 28480 | 0757-0915 | 1 |
| 0757-0916 | R:FXD MET FLM 470 OHM 2% 1/8W | 28480 | 0757-0916 | 1 |
| 0757-0917 | R:FXD MET FLM 510 OHM 2% 1/8W | 28480 | 0757-0917 | 1 |
| 0757-0922 | R:FXD MET FLM 820 OHM 2% 1/8W | 28480 | 0757-0922 | 1 |
| 0757-0923 | R:FXD MET FLM 910 OHM 2% 1/8W | 28480 | 0757-0923 | 4 |
| 0757-0924 | R:FXD MET FLM 1K OHM 2% 1/8W | 28480 | 0757-0924 | 8 |
| 0757-0925 | R:FXD MET FLM 1.1K OHM 2% 1/8W | 28480 | 0757-0925 | 6 |

See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|-----------|--------------------------------|-------|---------------|----|
| 0757-0926 | R:FXD MET FLM 1.2K OHM 2% 1/8W | 28480 | 0757-0926 | 2 |
| 0757-0930 | R:FXD MET FLM 1.8K OHM 2% 1/8W | 28480 | 0757-0930 | 2 |
| 0757-0931 | R:FXD MET FLM 2K OHM 2% 1/8W | 28480 | 0757-0931 | 2 |
| 0757-0932 | R:FXD MET FLM 2.2K OHM 2% 1/8W | 28480 | 0757-0932 | 13 |
| 0757-0934 | R:FXD MET FLM 2.7K OHM 2% 1/8W | 28480 | 0757-0934 | 6 |
| 0757-0936 | R:FXD MET FLM 3.3K OHM 2% 1/8W | 28480 | 0757-0936 | 7 |
| 0757-0938 | R:FXD MET FLM 3.9K OHM 2% 1/8W | 28480 | 0757-0938 | 1 |
| 0757-0939 | R:FXD MET FLM 4.3K OHM 2% 1/8W | 28480 | 0757-0939 | 1 |
| 0757-0940 | R:FXD MET FLM 4.7K OHM 2% 1/8W | 28480 | 0757-0940 | 5 |
| 0757-0941 | R:FXD MET FLM 5.1K OHM 2% 1/8W | 28480 | 0757-0941 | 2 |
| 0757-0942 | R:FXD MET FLM 5.6K OHM 2% 1/8W | 28480 | 0757-0942 | 1 |
| 0757-0944 | R:FXD MET FLM 6.8K OHM 2% 1/8W | 28480 | 0757-0944 | 3 |
| 0757-0945 | R:FXD MET FLM 7.5K OHM 2% 1/8W | 28480 | 0757-0945 | 1 |
| 0757-0946 | R:FXD MET FLM 8.2K OHM 2% 1/8W | 28480 | 0757-0946 | 3 |
| 0757-0948 | R:FXD MET FLM 10K OHM 2% 1/8W | 28480 | 0757-0948 | 10 |
| 0757-0949 | R:FXD MET FLM 11K OHM 2% 1/8W | 28480 | 0757-0949 | 1 |
| 0757-0950 | R:FXD MET FLM 12K OHM 2% 1/8W | 28480 | 0757-0950 | 3 |
| 0757-0951 | R:FXD MET FLM 13K OHM 2% 1/8W | 28480 | 0757-0951 | 1 |
| 0757-0952 | R:FXD MET FLM 15K OHM 2% 1/8W | 28480 | 0757-0952 | 1 |
| 0757-0954 | R:FXD MET FLM 18K OHM 2% 1/8W | 28480 | 0757-0954 | 1 |
| 0757-0955 | R:FXD MET FLM 20K OHM 2% 1/8W | 28480 | 0757-0955 | 9 |
| 0757-0956 | R:FXD MET FLM 22K OHM 2% 1/8W | 28480 | 0757-0956 | 11 |
| 0757-0962 | R:FXD MET FLM 39K OHM 2% 1/8W | 28480 | 0757-0962 | 1 |
| 0757-0965 | R:FXD MET FLM 51K OHM 2% 1/8W | 28480 | 0757-0965 | 9 |
| 0757-0970 | R:FXD MET FLM 82K OHM 2% 1/8W | 28480 | 0757-0970 | 6 |
| 0757-0972 | R:FXD MET FLM 100K OHM 2% 1/8W | 28480 | 0757-0972 | 3 |
| 0890-0048 | SLEEVE:TEFLON 1.3 LONG | 28480 | 0890-0048 | 5 |
| 1120-0140 | METER | 28480 | 1120-0140 | 1 |
| 1200-0159 | SOCKET:CRYSTAL | 28480 | 1200-0159 | 1 |
| 1250-0102 | CONNECTOR:BNC | 28480 | 1250-0102 | 2 |
| 1250-0745 | CONNECTOR:RF GPC-7 | 02660 | 131-1051 | 1 |
| 1250-0815 | INSULATOR:RF CONNECTOR | 02660 | 131-1053 | 1 |
| 1250-0821 | CONNECTOR:RF | 98291 | 50-007-0000 | 6 |
| 1250-0829 | CONNECTOR:RF | 98291 | 50-045-0000 | 4 |
| 1250-0830 | CONNECTOR:RF | 98291 | 50-047-0000 | 2 |
| 1251-0076 | CONNECTOR:30 PIN MALE | 71785 | 202-15-01-015 | 6 |
| 1251-0099 | CONNECTOR:RF 50 PIN | 28480 | 1251-0099 | 1 |
| 1251-0135 | CONNECTOR:BODY 15 PIN | 28480 | 1251-0135 | 1 |
| 1410-0015 | BEARING:BALL | 21335 | F40DFS58115 | 1 |
| 1410-0088 | BUSHING:1/4 DIA | 71041 | B46-2 | 1 |
| 1410-0141 | BUSHING:SLEEVE 3/16 DIA | 71041 | B34-2 | 1 |
| 1410-0729 | BEARING:DUPEXED BALL | 21335 | MV1KD-D8 | 1 |
| 1460-0036 | SPRING:COMPRESSION | 91260 | OBD | 1 |
| 1460-0268 | SPRING:COMPRESSION | 28480 | 1460-0268 | 1 |
| 1460-0297 | SPRING:COMPRESSION | 28480 | 1460-0297 | 1 |
| 1460-0702 | SPRING:ANTI-BACKLASH(COIL) | 28480 | 1460-0702 | 1 |
| 1480-0028 | PIN:DOWEL | 70276 | OBD | 1 |
| 1480-0208 | PIN:GROOVE | 28480 | 1480-0208 | 1 |
| 1850-0062 | TRANSISTOR:SILICON PNP | 28480 | 1850-0062 | 2 |
| 1853-0009 | TRANSISTOR:SILICON PNP | 28480 | 1853-0009 | 2 |
| 1853-0015 | TRANSISTOR:SILICON PNP 2N3640 | 28480 | 1853-0015 | 2 |

= See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| hp Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|--------------|-------------------------------------|-------|---------------|----|
| 1853-0018 | TRANSISTOR:SILICON PNP | 28480 | 1853-0018 | 1 |
| 1853-0036 | TRANSISTOR:SILICON PNP 2N3906 | 28480 | 1853-0036 | 12 |
| 1853-0054 | TRANSISTOR:SILICON PNP | 28480 | 1853-0054 | 2 |
| 1854-0003 | TRANSISTOR:SILICON NPN | 28480 | 1854-0003 | 2 |
| 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | 07263 | 2N708 | 18 |
| 1854-0019 | TRANSISTOR:SILICON NPN | 28480 | 1854-0019 | 5 |
| 1854-0022 | TRANSISTOR:SILICON NPN | 28480 | 1854-0022 | 2 |
| 1854-0048 | TRANSISTOR:SILICON NPN 2N2857 | 28480 | 1854-0048 | 10 |
| 1854-0071 | TRANSISTOR:SILICON NPN 2N3391 | 28480 | 1854-0071 | 5 |
| 1854-0073 | TRANSISTOR:SILICON NPN | 28480 | 1854-0073 | 5 |
| 1854-0092 | TRANSISTOR:SILICON NPN | 28480 | 1854-0092 | 11 |
| 1854-0233 | TRANSISTOR:SILICON NPN 2N3866 | 02735 | 2N3866 | 1 |
| 1901-0022 | DIODE:SILICON 0.56V AT 1 MA | 28480 | 1901-0022 | 1 |
| 1901-0025 | DIODE:SILICON 100 WV 12 PF | 28480 | 1901-0025 | 2 |
| 1901-0040 | DIODE:SILICON 30 WV 30MA | 28480 | 1901-0040 | 18 |
| 1901-0179 | DIODE:SILICON 15WV | 28480 | 1901-0179 | 2 |
| 1901-0347 | DIODE:SILICON | 28480 | 1901-0347 | 2 |
| 1901-0480 | DIODE:SILICON HOT CARRIER | 28480 | 1901-0480 | 1 |
| 1901-0481 | DIODE:SILICON HOT CARRIER | 28480 | 1901-0481 | 1 |
| 1902-0062 | DIODE BREAKDOWN:3.47V | 28480 | 1902-0062 | 1 |
| 1902-3079 | DIODE:ZENER 4V | 28480 | 1902-3079 | 4 |
| 1910-0016 | DIODE:GERMANIUM 60 WIV | 28480 | 1910-0016 | 10 |
| 1910-0022 | DIODE:GERMANIUM 5 WIV | 28480 | 1910-0022 | 2 |
| 1912-0012 | DIODE:GERMANIUM TUNNEL | 28480 | 1912-0012 | 1 |
| 2100-0898 | R:VAR WW 500 OHM 5% | 28480 | 2100-0898 | 1 |
| 2100-0969 | R:VAR MET FLM 50K OHM 20% | 28480 | 2100-0969 | 1 |
| 2100-1758 | R:VAR WW 1K OHM 10% LIN 1/2W | 28480 | 2100-1758 | 1 |
| 2360-0018 | SCREW:SST RH 6-32 X 1-1/2 | 28480 | 2360-0018 | 1 |
| 2360-0019 | SCREW:SST RH 6-32 X 1-3/4 | 28480 | 2360-0019 | 1 |
| 3020-0004 | SCREW:STL SOCKET CAP 1/4-20 X 3/ | 28480 | 3020-0004 | 1 |
| 3030-0001 | SCREW:STL SET 8-32 X 3/16" | 28480 | 3030-0001 | 1 |
| 3030-0007 | SCREW:STL SET 4-40 X 0.125 | 28480 | 3030-0007 | 1 |
| 3030-0013 | SCREW:STL SOCKET CAP 6-32 X 3/4" | 28480 | 3030-0013 | 1 |
| 3030-0022 | SCREW:STL SET 6-32 X 1/8W | 28480 | 3030-0022 | 1 |
| 3030-0057 | SCREW:SET STL SOCKET DR 2-56 X 3/32 | 28480 | 3030-0057 | 1 |
| 3050-0028 | WASHER:BR5 7/16 X 1/4 | 78471 | 0BD | 1 |
| 3050-0100 | WASHER:FLAT BR5 FOR #6 SCREW | 00000 | 0BD | 1 |
| 3050-0159 | WASHER:NYLON #6 | 80120 | 0BD | 1 |
| 3050-0381 | WASHER:THRUST(DELRI) | 28480 | 3050-0381 | 1 |
| 5020-3247 | BODY:FEMALE | 28480 | 5020-3247 | 1 |
| 5020-3249 | PIN:FEMALE | 28480 | 5020-3249 | 1 |
| 8180-0224 | WIRE:#24 1.6 LONG | 28480 | 8180-0224 | 5 |
| 9100-0346 | COIL:FXD 0.05 UH 20% | 36196 | H-10886 | 3 |
| 9100-0368 | COIL:FXD 0.33 UH 10% | 36196 | 1A-3303M | 1 |
| 9100-1724 | COIL:FXD 0.22 UH 10% | 99800 | 1025-04 | 1 |
| 9140-0029 | COIL:RF CHOKE 100 MH | 99848 | 3100-15-101 | 3 |
| 9140-0095 | COIL:FXD RF 0.27 MH 10% | 99800 | 1537 SERIES | 5 |
| 9140-0105 | COIL:MOLDED CHOKE 8.20 UH 10% | 28480 | 9140-0105 | 2 |
| 9140-0120 | COIL:FXD 0.1 MH 20% | 99800 | 0BD | 1 |
| 9140-0126 | COIL:VAR 1.76-4.02 MH | 28480 | 9140-0126 | 1 |
| 9140-0144 | COIL:FXD RF 4.7 MH 10% | 99800 | 1025-36 | 1 |
| 9140-0158 | COIL:FXD RF 1 UH 10% | 99800 | 1025-20 | 1 |
| 05254-2031 | GEAR- DRIVER | 28480 | 05254-2031 | 1 |
| 05254-2032 | GEAR- DIAL TRAIN #1 | 28480 | 05254-2032 | 1 |

See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|------------|-------------------------------|-------|---------------|----|
| 05254-2033 | GEAR- DIAL TRAIN #2 | 28480 | 05254-2033 | 1 |
| 05255-2004 | BOARD- BLANK | 28480 | 05255-2004 | 1 |
| 05255-2003 | BOARD- BLANK | 28480 | 05255-2003 | 1 |
| 05255-2002 | BOARD-BLANK | 28480 | 05255-2002 | 1 |
| 05255-2001 | BOARD- BLANK | 28480 | 05255-2001 | 1 |
| 05255-2008 | BOARD- BLANK | 28480 | 05255-2008 | 1 |
| 05255-2006 | BOARD- BLANK | 28480 | 05255-2006 | 1 |
| 05255-2005 | BOARD- BLANK | 28480 | 05255-2005 | 1 |
| 05255-2007 | BOARD- BLANK | 28480 | 05255-2007 | 1 |
| 05255-2011 | CONDUCTOR- CENTER REAR | 28480 | 05255-2011 | 1 |
| 05255-2014 | BODY - MIXER CAVITY | 28480 | 05255-2014 | 1 |
| 05255-2015 | END- FRONT | 28480 | 05255-2015 | 1 |
| 05255-2021 | SCREW-PROBE DRIVE LEAD | 28480 | 05255-2021 | 1 |
| 05255-2022 | NUT- PROBE DRIVE LEAD | 28480 | 05255-2022 | 1 |
| 05255-2025 | NUT- INNER RING LOCK | 28480 | 05255-2025 | 1 |
| 05255-2026 | HOUSING- PROBE DRIVE BEARING | 28480 | 05255-2026 | 1 |
| 05255-2027 | SCREW OUTER RING LOCK | 28480 | 05255-2027 | 1 |
| 05255-2028 | HOUSING- PROBE DRIVE | 28480 | 05255-2028 | 1 |
| 05255-2020 | CONTACT- SLIDING REAR | 28480 | 05255-2020 | 1 |
| 05255-2031 | MOUNT GEAR | 28480 | 05255-2031 | 1 |
| 05255-2032 | SHAFT- TRANSFER | 28480 | 05255-2032 | 1 |
| 05255-2033 | SHAFT- INPUT | 28480 | 05255-2033 | 1 |
| 05255-2039 | GEAR- DRIVE PINION | 28480 | 05255-2039 | 1 |
| 05255-2035 | GEAR #1- FXD | 28480 | 05255-2035 | 1 |
| 05255-2036 | GEAR #1- ANTI-BACKLASH | 28480 | 05255-2036 | 1 |
| 05255-2037 | GEAR #2- FIXED | 28480 | 05255-2037 | 1 |
| 05255-2038 | GEAR #2- ANTI-BACKLASH | 28480 | 05255-2038 | 1 |
| 05255-2040 | GEAR-DRIVEN PINION | 28480 | 05255-2040 | 1 |
| 05255-2041 | GEAR- DRIVER STOP | 28480 | 05255-2041 | 1 |
| 05255-2042 | GEAR- OFFSET STOP | 28480 | 05255-2042 | 1 |
| 05255-2044 | SHAFT- IDLER GEAR | 28480 | 05255-2044 | 1 |
| 05255-2059 | CARD- ATTENUATOR | 28480 | 05255-2059 | 3 |
| 05255-2054 | GEAR- DIAL DRIVE | 28480 | 05255-2054 | 1 |
| 05255-2051 | PLUG- TEFLON | 28480 | 05255-2051 | 1 |
| 05255-2053 | BUSHING-TEFLON | 28480 | 05255-2053 | 1 |
| 05255-2060 | SPRING-ANTI-BACKLASH | 28480 | 05255-2060 | 2 |
| 05255-0001 | COVER- MIXER | 28480 | 05255-0001 | 1 |
| 05255-0013 | PLATE- BOTTOM | 28480 | 05255-0013 | 1 |
| 05255-0014 | PLATE- DRIVE COVER | 28480 | 05255-0014 | 1 |
| 05255-0015 | PLATE- SPRING PRESSURE | 28480 | 05255-0015 | 1 |
| 05255-0017 | SPRING: CONTACT | 28480 | 05255-0017 | 1 |
| 05255-4003 | MOUNT- DIAL BUSHING | 28480 | 05255-4003 | 1 |
| 05255-4006 | RETAINER- SPRING | 28480 | 05255-4006 | 1 |
| 05255-6004 | ASSY:PHASE DETECTOR BOARD | 28480 | 05255-6004 | 1 |
| 05255-6003 | BD. ASSY. OSCILLATOR | 28480 | 05255-6003 | 1 |
| 05255-6002 | 50MC AMPLIFIER | 28480 | 05255-6002 | 1 |
| 05255-6001 | BOARD ASSY.- 200 MC AMPLIFIER | 28480 | 05255-6001 | 1 |
| 05255-6008 | BOARD ASSY.- VIDEO AMPLIFIER | 28480 | 05255-6008 | 1 |
| 05255-6006 | BOARD ASSY.- PRESCALER | 28480 | 05255-6006 | 1 |
| 05255-6005 | ASSY:CONTROL BOARD | 28480 | 05255-6005 | 1 |

= See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|--------------|------------------------------------|-------|---------------|----|
| 05255-6007 | BOARD ASSY.- GATE TIME EXTENDER | 28480 | 05255-6007 | 1 |
| 05255-6019 | COIL ASSY | 28480 | 05255-6019 | 7 |
| 05255-6016 | ASSY:HARMONIC GENERATOR | 28480 | 05255-6016 | 1 |
| 05255-6017 | AUX OUTPUT CABLE ASSY:INCL P5 | 28480 | 05255-6017 | 1 |
| 05255-6010 | GEAR ASSY. #1- ANTI-BACKLASH | 28480 | 05255-6010 | 1 |
| 05255-6011 | GEAR ASSY. #2- ANTI-BACKLASH | 28480 | 05255-6011 | 1 |
| 05255-6012 | DRIVE ASSY.- PROBE | 28480 | 05255-6012 | 1 |
| 05255-6013 | CAVITY ASSY.- MIXER | 28480 | 05255-6013 | 1 |
| 05255-6014 | BACK CAVITY AND FINGER ASSY. | 28480 | 05255-6014 | 1 |
| 05255-6020 | COIL ASSY.- VIDEO AMP. | 28480 | 05255-6020 | 3 |
| 05255-6021 | TRANSFORMER- VIDEO AMP. | 28480 | 05255-6021 | 1 |
| 05255-6027 | DRIVE ASSY.- GEAR | 28480 | 05255-6027 | 1 |
| 05255-6029 | SLIDER ASSY.- PROBE | 28480 | 05255-6029 | 1 |
| 05255-6023 | CABLE ASSY.- (+) INPUT | 28480 | 05255-6023 | 1 |
| 05255-6024 | CABLE ASSY.- (-) INPUT | 28480 | 05255-6024 | 1 |
| 05255-6032 | COIL ASSY.- VIDEO AMP. | 28480 | 05255-6032 | 2 |
| 05255-6034 | PANEL ASSY.- FRONT | 28480 | 05255-6034 | 1 |
| 05255-6031 | ATTENUATOR ASSY.- | 28480 | 05255-6031 | 1 |
| 05255-6035 | HOLDER ASSY.- DIODE | 28480 | 05255-6035 | 1 |
| 05255-6018 | AUX INPUT CABLE ASSY:INCL P4 | 28480 | 05255-6018 | 1 |
| 05255-6026 | PRESCALER INPUT CABLE ASSY:INCL P9 | 28480 | 05255-6026 | 2 |
| 05255-6028 | VIDEO AMPLIFIER ASSY | 28480 | 05255-6028 | 1 |
| 05255-6033 | MAIN CABLE ASSY:INCL P6 | 28480 | 05255-6033 | 1 |
| 08491-2002 | BEAD | 28480 | 08491-2002 | 1 |
| 08491-2006 | SHELL:CARTRIDGE | 28480 | 08491-2006 | 1 |
| 08551-2108 | GUIDES:CARD | 28480 | 08551-2108 | 1 |
| 107A-69A-16H | STUD:SHORT | 28480 | 107A-69A-16H | 2 |
| 107A-69A-16J | STUD:LONG | 28480 | 107A-69A-16J | 2 |

See list of abbreviations in introduction to this section

Table 6-3. Code List of Manufacturers

The following code numbers are from the Federal Supply Code for Manufacturers Cataloging Handbooks H4-1 (Name to Code) and H4-2 (Code to Name) and their latest supplements. The date of revision and the date of the supplements used appear at the bottom of each page. Alphabetical codes have been arbitrarily assigned to suppliers not appearing in the H4 Handbooks.

| Code No. | Manufacturer | Address | Code No. | Manufacturer | Address | Code No. | Manufacturer | Address |
|----------|---|-----------------------------------|----------|--|--------------------------------|----------|--|--------------------------------|
| 00000 | U.S.A. Common | Any supplier of U.S. | 05729 | Metro-Tel Corp. | Westbury, N.Y. | 12881 | Metex Electronics Corp. | Clark, N.J. |
| 00136 | McCoy Electronics | Mount Holly Springs, Pa. | 05783 | Stewart Engineering Co. | Santa Cruz, Calif. | 12930 | Delta Semiconductor Inc. | Newport Beach, Calif. |
| 00213 | Sage Electronics Corp. | Rochester, N.Y. | 05820 | Wakefield Engineering Inc. | Wakefield, Mass. | 12954 | Dickson Electronics Corp. | Scottsdale, Arizona |
| 00287 | Cemco Inc. | Danielson, Conn. | 06004 | Bassick Co., The | Bridgeport, Conn. | 13103 | Thermolloy | Dallas, Texas |
| 00334 | Humidial | Colton, Calif. | 06090 | Raychem Corp. | Redwood City, Calif. | 13396 | Telefunken (GmbH) | Hanover, Germany |
| 00348 | Microtron Co., Inc. | Valley Stream, N.Y. | 06175 | Bausch and Lomb Optical Co. | Rochester, N.Y. | 13835 | Midland-Wright Div. of Pacific Industries, Inc. | Kansas City, Kansas |
| 00373 | Garlock Inc., Electronics Products Div. | Camden, N.J. | 06402 | E.T.A. Products Co. of America | Chicago, Ill. | 14099 | Sem-Tech | Newbury Park, Calif. |
| 00656 | Aerovox Corp. | New Bedford, Mass. | 06540 | Amatom Electronic Hardware Co., Inc. | New Rochelle, N.Y. | 14193 | Calif. Resistor Corp. | Santa Monica, Calif. |
| 00779 | Amp. Inc. | Harrisburg, Pa. | 06555 | Beede Electrical Instrument Co., Inc. | Penacook, N.H. | 14298 | American Components, Inc. | Conshohocken, Pa. |
| 00781 | Aircraft Radio Corp. | Boonton, N.J. | 06666 | General Devices Co., Inc. | Indianapolis, Ind. | 14433 | ITT Semiconductor, A Div. of Int. Telephone & Telegraph Corp. | West Palm Beach, Fla. |
| 00815 | Northern Engineering Laboratories, Inc. | Burlington, Wis. | 06751 | Sencor Div. Components Inc. | Phoenix, Ariz. | 14493 | Hewlett-Packard Company | Loveland, Colo. |
| 00853 | Sangamo Electric Co., Pickens Div. | Pickens, S.C. | 06812 | Torrington Mfg. Co., West Div. | Van Nuys, Calif. | 14655 | Cornell Dublier Electric Corp. | Newark, N.J. |
| 00866 | Goe Engineering Co. | Los Angeles, Calif. | 06980 | Varian Assoc. Eimac Div. | San Carlos, Calif. | 14674 | Corning Glass Works | Corning, N.Y. |
| 00891 | Carl E. Holmes Corp. | Los Angeles, Calif. | 07088 | Kelvin Electric Co. | Van Nuys, Calif. | 14752 | Electro Cube Inc. | So. Pasadena, Calif. |
| 00929 | Microlab Inc. | Livingston, N.J. | 07126 | Digitran Co. | Pasadena, Calif. | 14960 | Williams Mfg. Co. | San Jose, Calif. |
| 01009 | Alden Products Co. | Brockton, Mass. | 07137 | Transistor Electronics Corp. | Minneapolis, Minn. | 15203 | Webster Electronics Co. | New York, N.Y. |
| 01121 | Allen Bradley Co. | Milwaukee, Wis. | 07138 | Westinghouse Electric Corp. Electronic Tube Div. | Elmira, N.Y. | 15291 | Adjustable Bushing Co. | N. Hollywood, Calif. |
| 01255 | Litton Industries, Inc. | Beverly Hills, Calif. | 07149 | Filmohm Corp. | New York, N.Y. | 15558 | Micron Electronics | Garden City, Long Island, N.Y. |
| 01281 | TRW Semiconductors, Inc. | Lawndale, Calif. | 07233 | Cinch-Graphik Co. | City of Industry, Calif. | 15566 | Amprobe Inst. Corp. | Lynbrook, N.Y. |
| 01295 | Texas Instruments, Inc., Transistor Products Div. | Dallas, Texas | 07261 | Avnet Corp. | Culver City, Calif. | 15772 | Twentieth Century Coil Spring Co. | Santa Clara, Calif. |
| 01349 | The Alliance Mfg. Co. | Alliance, Ohio | 07263 | Fairchild Camera & Inst. Corp. Semiconductor Div. | Mountain View, Calif. | 15818 | Amelco Inc. | Mt. View, Calif. |
| 01589 | Pacific Relays, Inc. | Van Nuys, Calif. | 07322 | Minnesota Rubber Co. | Minneapolis, Minn. | 15909 | Daven Div. Thomas A. Edison Ind. McGraw-Edison Co. | Long Island City, N.Y. |
| 01930 | Amerock Corp. | Rockford, Ill. | 07387 | Birtcher Corp., The | Monterey Park, Calif. | 16037 | Spruce Pine Mica Co. | Spruce Pine, N.C. |
| 01961 | Pulse Engineering Co. | Santa Clara, Calif. | 07700 | Technical Wire Products Inc. | Cranford, N.J. | 16179 | Omni-Spectra Inc. | Detroit, Ill. |
| 02114 | Ferroxcube Corp. of America | Saugerties, N.Y. | 07910 | Continental Device Corp. | Hawthorne, Calif. | 16352 | Computer Diode Corp. | Lodi, N.J. |
| 02286 | Cole Rubber and Plastics Inc. | Sunnyvale, Calif. | 07933 | Raytheon Mfg. Co., Semiconductor Div. | Mountain View, Calif. | 16688 | Ideal Prec. Meter Co., Inc. De Jur Meter Div. | Brooklyn, N.Y. |
| 02660 | Amphenol-Borg Electronics Corp. | Chicago, Ill. | 07966 | Shockley Semi-Conductor Laboratories | Palo Alto, Calif. | 16758 | Delco Radio Div. of G.M. Corp. | Kokomo, Inc. |
| 02735 | Radio Corp. of America, Semiconductor and Materials Div. | Somerville, N.J. | 07980 | Hewlett-Packard Co., Boonton Radio Div. | Rockaway, N.J. | 17109 | Thermonetics Inc. | Canoga Park, Calif. |
| 02771 | Vocaline Co. of America, Inc. | Old Saybrook, Conn. | 08145 | U.S. Engineering Co. | Los Angeles, Calif. | 17474 | Tranex Company | Mountain View, Calif. |
| 02777 | Hopkins Engineering Co. | San Fernando, Calif. | 08289 | Blinn, Delbert Co. | Pomona, Calif. | 17675 | Hamlin Metal Products Corp. | Akron, Ohio |
| 03508 | G.E. Semiconductor Prod. Dept. | Syracuse, N.Y. | 08358 | Burgess Battery Co. | Niagara Falls, Ontario, Canada | 17745 | Angstrom Prec. Inc. | No. Hollywood, Calif. |
| 03705 | Apex Machine & Tool Co. | Dayton, Ohio | 08654 | Bristol Co., The | Waterbury, Conn. | 18042 | Power Design Pacific Inc. | Palo Alto, Calif. |
| 03797 | Eldema Corp. | Compton, Calif. | 08717 | Sloan Company | Sun Valley, Calif. | 18476 | Ty-Car Mfg. Co., Inc. | Holliston, Mass. |
| 03877 | Transitron Electric Corp. | Wakefield, Mass. | 08718 | ITT Cannon Electric Inc., Phoenix Div. | Phoenix, Arizona | 18486 | TRW Elect. Comp. Div. | Des Plaines, Ill. |
| 03888 | Pyrofilm Resistor Co., Inc. | Cedar Knolls, N.J. | 08792 | CBS Electronics Semiconductor Operations, Div. of C.B.S. Inc. | Lowell, Mass. | 18583 | Curtis Instrument, Inc. | Mt. Kisco, N.Y. |
| 03954 | Singer Co., Diehl Div. Finderne Plant | Sumerville, N.J. | 08984 | Mel-Rain | Indianapolis, Ind. | 18873 | E.I. DuPont and Co., Inc. | Wilmington, Del. |
| 04009 | Arrow, Hart and Hegeman Elect. Co. | Hartford, Conn. | 09026 | Babcock Relays Div. | Costa Mesa, Calif. | 18911 | Durant Mfg. Co. | Milwaukee, Wis. |
| 04013 | Taurus Corp. | Lambertville, N.J. | 09134 | Texas Capacitor Co. | Houston, Texas | 19315 | Bendix Corp., The Eclipse-Pioneer Div. | Teterboro, N.J. |
| 04222 | Hi-Q Division of Aerovox | Myrtle Beach, S.C. | 09145 | Atohm Electronics | Sun Valley, Calif. | 19500 | Thomas A. Edison Industries, Div. of McGraw-Edison Co. | West Orange, N.J. |
| 04354 | Precision Paper Tube Co. | Chicago, Ill. | 09250 | Electro Assemblies, Inc. | Chicago, Ill. | 19644 | LRC Electronics | Horseheads, N.Y. |
| 04404 | Dymec Division of Hewlett-Packard Co. | Palo Alto, Calif. | 09569 | Mallory Battery Co. of Canada, Ltd. | Toronto, Ontario, Canada | 19701 | Electra Mfg. Co. | Independence, Kansas |
| 04651 | Sylvania Electric Products, Microwave Device Div. | Mountain View, Calif. | 10214 | General Transistor Western Corp. | Los Angeles, Calif. | 20183 | General Atomics Corp. | Philadelphia, Pa. |
| 04713 | Motorola, Inc., Semiconductor Prod. Div. | Phoenix, Arizona | 10411 | Ti-Tal, Inc. | Berkeley, Calif. | 21226 | Executone, Inc. | Long Island City, N.Y. |
| 04732 | Filtron Co., Inc. Western Div. | Culver City, Calif. | 10646 | Carborundum Co. | Niagara Falls, N.Y. | 21335 | Fafnir Bearing Co., The | New Britain, Conn. |
| 04773 | Automatic Electric Co. | Northlake, Ill. | 11236 | CTS of Berne, Inc. | Berne, Ind. | 21520 | Fansteel Metallurgical Corp. | N. Chicago, Ill. |
| 04796 | Sequoia Wire Co. | Redwood City, Calif. | 11237 | Chicago Telephone of California, Inc. | So. Pasadena, Calif. | 23783 | British Radio Electronics Ltd. | Washington, D.C. |
| 04811 | Precision Coil Spring Co. | El Monte, Calif. | 11242 | Bay State Electronics Corp. | Waltham, Mass. | 24455 | G.E. Lamp Division | Nela Park, Cleveland, Ohio |
| 04870 | P.M. Motor Company | Westchester, Ill. | 11312 | Teledyne Inc., Microwave Div. | Palo Alto, Calif. | 24655 | General Radio Co. | West Concord, Mass. |
| 05006 | Twentieth Century Plastics, Inc. | Los Angeles, Calif. | 11534 | Duncan Electronics Inc. | Costa Mesa, Calif. | 26365 | Gries Reproducer Corp. | New Rochelle, N.Y. |
| 05277 | Westinghouse Electric Corp. Semi-Conductor Dept. | Youngwood, Pa. | 11711 | General Instrument Corp., Semiconductor Div., Products Group | Newark, N.J. | 26462 | Grobet File Co. of America, Inc. | Carlstadt, N.J. |
| 05347 | Ultronix, Inc. | San Mateo, Calif. | 11717 | Imperial Electronic, Inc. | Buena Park, Calif. | 26992 | Hamilton Watch Co. | Lancaster, Pa. |
| 05593 | Illumintron Engineering Co. | Sunnyvale, Calif. | 11870 | Melabs, Inc. | Palo Alto, Calif. | 28480 | Hewlett-Packard Co. | Palo Alto, Calif. |
| 05616 | Cosmo Plastic (c/o Electrical Spec. Co.) | Cleveland, Ohio | 12136 | Philadelphia Handle Co. | Camden, N.J. | 33173 | G.E. Receiving Tube Dept. | Owensboro, Ky. |
| 05624 | Barber Colman Co. | Rockford, Ill. | 12697 | Clarostat Mfg. Co. | Dover, N.H. | 35434 | Lectrohm Inc. | Chicago, Ill. |
| 05728 | Tiffen Optical Co. | Roslyn Heights, Long Island, N.Y. | 12859 | Nippon Electric Co., Ltd. | Tokyo, Japan | 36196 | Stanwyck Coil Products Ltd. | Hawkesbury, Ontario, Canada |

Table 6-3. Code List of Manufacturers (Cont'd)

| Code No. | Manufacturer | Address | Code No. | Manufacturer | Address | Code No. | Manufacturer | Address |
|----------|---|------------------------|----------|---|------------------------|----------|--|--|
| 44655 | Ohmite Mfg. Co. | Skokie, Ill. | 72964 | Robert M. Hadley Co. | Los Angeles, Calif. | 80031 | Mepco Division of Sessions Clock Co. | Morristown, N.J. |
| 46384 | Penn Eng. & Mfg. Corp. | Doylestown, Pa. | 72982 | Erie Technological Products, Inc. | Erie, Pa. | 80120 | Schnitzer Alloy Products Co. | Elizabeth, N.J. |
| 47904 | Polaroid Corp. | Cambridge, Mass. | 73061 | Hansen Mfg. Co., Inc. | Princeton, Ind. | 80130 | Times Telephoto Equipment | New York, N.Y. |
| 48620 | Precision Thermometer & Inst. Co. | Southampton, Pa. | 73076 | H.M. Harper Co. | Chicago, Ill. | 80131 | Electronic Industries Association. Any brand | Tube meeting EIA Standards-Washington, DC. |
| 49956 | Microwave & Power Tube Div. | Waltham, Mass. | 73138 | Helipot Div. of Beckman Inst., Inc. | Fullerton, Calif. | 80207 | Unimax Switch, Div. Maxon Electronics Corp. | Wallingford, Conn. |
| 52090 | Rowan Controller Co. | Westminster, Md. | 73293 | Hughes Products Division of Hughes Aircraft Co. | Newport Beach, Calif. | 80223 | United Transformer Corp. | New York, N.Y. |
| 52983 | Sanborn Company | Waltham, Mass. | 73445 | Amperex Electronic Co., Div. of North American Phillips Co., Inc. | Hicksville, N.Y. | 80248 | Oxford Electric Corp. | Chicago, Ill. |
| 54294 | Shallcross Mfg. Co. | Selma, N.C. | 73506 | Bradley Semiconductor Corp. | New Haven, Conn. | 80294 | Bourns Inc. | Riverside, Calif. |
| 55026 | Simpson Electric Co. | Chicago, Ill. | 73559 | Carling Electric, Inc. | Hartford, Conn. | 80411 | Acro Div. of Robertshaw Controls Co. | Columbus, Ohio |
| 55933 | Sonotone Corp. | Elmsford, N.Y. | 73682 | George K. Garrett Co., Div. MSL Industries Inc. | Philadelphia, Pa. | 80486 | All Star Products Inc. | Defiance, Ohio |
| 55938 | Raytheon Co. Commercial Apparatus & Systems Div. | So. Norwalk, Conn. | 73734 | Federal Screw Products Inc. | Chicago, Ill. | 80509 | Avery Adhesive Label Corp. | Monrovia, Calif. |
| 56137 | Spaulding Fibre Co., Inc. | Tonawanda, N.Y. | 73743 | Fischer Special Mfg. Co. | Cincinnati, Ohio | 80583 | Hammarlund Co., Inc. | New York, N.Y. |
| 56289 | Sprague Electric Co. | North Adams, Mass. | 73793 | General Industries Co., The | Elyria, Ohio | 80640 | Stevens, Arnold, Co., Inc. | Boston, Mass. |
| 59446 | Telex, Inc. | St. Paul, Minn. | 73846 | Goshen Stamping & Tool Co. | Goshen, Ind. | 81030 | International Instruments Inc. | Orange, Conn. |
| 59730 | Thomas & Betts Co. | Elizabeth, N.J. | 73899 | JFD Electronics Corp. | Brooklyn, N.Y. | 81073 | Grayhill Co. | LaGrange, Ill. |
| 60741 | Triplett Electrical Inst. Co. | Bluffton, Ohio | 73905 | Jennings Radio Mfg. Corp. | San Jose, Calif. | 81095 | Triad Transformer Corp. | Venice, Calif. |
| 61775 | Union Switch and Signal, Div. of Westinghouse Air Brake Co. | Pittsburgh, Pa. | 74276 | Signalite Inc. | Neptune, N.J. | 81312 | Winchester Elec. Div. Litton Ind., Inc. | Oakville, Conn. |
| 62119 | Universal Electric Co. | Owosso, Mich. | 74455 | J.H. Winns, and Sons | Winchester, Mass. | 81349 | Military Specification | ... |
| 63743 | Ward-Leonard Electric Co. | Mt. Vernon, N.Y. | 74861 | Industrial Condenser Corp. | Chicago, Ill. | 81483 | International Rectifier Corp. | El Segundo, Calif. |
| 64959 | Western Electric Co., Inc. | New York, N.Y. | 74868 | R.F. Products Division of Amphenol-Borg Electronics Corp. | Danbury, Conn. | 81541 | Airpax Electronics, Inc. | Cambridge, Mass. |
| 65092 | Weston Inst. Inc. Weston-Newark | Newark, N.J. | 74970 | E.F. Johnson Co. | Waseca, Minn. | 81860 | Barry Controls, Div. Barry Wright Corp. | Watertown, Mass. |
| 66295 | Willek Mfg. Co. | Chicago, Ill. | 75042 | International Resistance Co. | Philadelphia, Pa. | 82042 | Carter Precision Electric Co. | Skokie, Ill. |
| 66346 | Revere Wollansak Div. Minn. Mining & Mfg. Co. | St. Paul, Minn. | 75378 | CTS Knights Inc. | Sandwich, Ill. | 82047 | Sperli Faraday Inc., Copper Hewitt Electric Div. | Hoboken, N.J. |
| 70276 | Allen Mfg. Co. | Hartford, Conn. | 75382 | Kulka Electric Corporation | Mt. Vernon, N.Y. | 82142 | Jeffers Electronics Division of Speer Carbon Co. | Du Bois, Pa. |
| 70318 | Allmetal Screw Product Co., Inc. | Garden City, N.Y. | 75818 | Lenz Electric Mfg. Co. | Chicago, Ill. | 82170 | Fairchild Camera & Inst. Corp., Defense Prod. Division | Clifton, N.J. |
| 70485 | Atlantic India Rubber Works, Inc. | Chicago, Ill. | 75915 | Littlefuse, Inc. | Des Plaines, Ill. | 82209 | Maguire Industries, Inc. | Greenwich, Conn. |
| 70563 | Amperite Co., Inc. | Union City, N.J. | 76005 | Lord Mfg. Co. | Erie, Pa. | 82219 | Sylvania Electric Prod. Inc. Electronic Tube Division | Emporium, Pa. |
| 70903 | Belden Mfg. Co. | Chicago, Ill. | 76210 | C.W. Marwedel | San Francisco, Calif. | 82376 | Astron Corp. | East Newark, N.J. |
| 70998 | Bird Electronic Corp. | Cleveland, Ohio | 76487 | James Millen Mfg. Co., Inc. | Malden, Mass. | 82389 | Switchcraft, Inc. | Chicago, Ill. |
| 71002 | Birnbach Radio Co. | New York, N.Y. | 76493 | J.W. Miller Co. | Los Angeles, Calif. | 82647 | Metals & Controls Inc. Spencer Products | Attleboro, Mass. |
| 71041 | Boston Gear Works Div. of Murray Co. of Texas | Quincy, Mass. | 76530 | Cinch-Monadnock, Div. of United Carr Fastener Corp. | San Leandro, Calif. | 82768 | Phillips-Advance Control Co. | Joliet, Ill. |
| 71218 | Bud Radio, Inc. | Willoughby, Ohio | 76545 | Mueller Electric Co. | Cleveland, Ohio | 82866 | Research Products Corp. | Madison, Wis. |
| 71286 | Camloc Fastener Corp. | Paramus, N.J. | 76703 | National Union | Newark, N.J. | 82877 | Rotron Mfg. Co., Inc. | Woodstock, N.Y. |
| 71313 | Cardwell Condenser Corp. | Lindenhurst L.I., N.Y. | 76854 | Oak Manufacturing Co. | Crystal Lake, Ill. | 82893 | Vector Electronic Co. | Glendale, Calif. |
| 71400 | Bussmann Mfg. Div. of McGraw-Edison Co. | St. Louis, Mo. | 77068 | Bendix Corp., The Bendix Pacific Div. | N. Hollywood, Calif. | 83053 | Western Washer Mfg. Co. | Los Angeles, Calif. |
| 71436 | Chicago Condenser Corp. | Chicago, Ill. | 77075 | Pacific Metals Co. | San Francisco, Calif. | 83058 | Carr Fastener Co. | Cambridge, Mass. |
| 71447 | Calif. Spring Co., Inc. | Pico-Rivera, Calif. | 77221 | Phanostran Instrument and Electronic Co. | South Pasadena, Calif. | 83086 | New Hampshire Ball Bearing, Inc. | Peterborough, N.H. |
| 71450 | CTS Corp. | Elkhart, Ind. | 77342 | American Machine & Foundry Co. Potter & Brumfield Div. | Princeton, Ind. | 83125 | General Instrument Corp., Capacitor Div. | Darlington, S.C. |
| 71468 | ITT Cannon Electric Inc. | Los Angeles, Calif. | 77630 | TRW Electronic Components Div. | Camden, N.J. | 83148 | ITT Wire and Cable Div. | Los Angeles, Calif. |
| 71471 | Cinema Plant, Hi-Q Div. Aerovox Corp. | Burbank, Calif. | 77638 | General Instrument Corp., Rectifier Div. | Brooklyn, N.Y. | 83186 | Victory Engineering Corp. | Springfield, N.J. |
| 71482 | C.P. Clare & Co. | Chicago, Ill. | 77764 | Resistance Products Co. | Harrisburg, Pa. | 83298 | Bendix Corp., Red Bank Div. | Red Bank, N.J. |
| 71590 | Centralab Div. of Globe Union Inc. | Milwaukee, Wis. | 77969 | Rubbercraft Corp. of Calif. | Torrance, Calif. | 83315 | Hubbell Corp. | Mundelein, Ill. |
| 71616 | Commercial Plastics Co. | Chicago, Ill. | 78189 | Shakeproof Division of Illinois Tool Works | Elgin, Ill. | 83330 | Smith, Herman H., Inc. | Brooklyn, N.Y. |
| 71700 | Cornish Wire Co., The | New York, N.Y. | 78283 | Signal Indicator Corp. | New York, N.Y. | 83385 | Central Screw Co. | Chicago, Ill. |
| 71707 | Colo Coil Co., Inc. | Providence, R.I. | 78290 | Struthers-Dunn Inc. | Pitman, N.J. | 83501 | Gavitt Wire and Cable Co. Div. of Amerace Corp. | Brookfield, Mass. |
| 71744 | Chicago Miniature Lamp Works | Chicago, Ill. | 78452 | Thompson-Bremer & Co. | Chicago, Ill. | 83594 | Burroughs Corp. Electronic Tube Div. | Plainfield, N.J. |
| 71753 | A.O. Smith Corp., Crowley Div. | West Orange, N.J. | 78471 | Tilley Mfg. Co. | San Francisco, Calif. | 83740 | Union Carbide Corp. Consumer Prod. Div. | New York, N.Y. |
| 71785 | Cinch Mfg. Co., Howard B. Jones Div. | Chicago, Ill. | 78488 | Stackpole Carbon Co. | St. Marys, Pa. | 83777 | Model Eng. and Mfg., Inc. | Huntington, Ind. |
| 71984 | Dow Corning Corp. | Midland, Mich. | 78493 | Standard Thomson Corp. | Waltham, Mass. | 83821 | Lloyd Scruggs Co. | Festus, Mo. |
| 72136 | Electro Motive Mfg. Co., Inc. Willimantic, Conn. | Willimantic, Conn. | 78553 | Tinnerman Products, Inc. | Cleveland, Ohio | 83942 | Aeronautical Inst. & Radio Co. | Lodi, N.J. |
| 72354 | John E. Fast Co., Div. Victoreen Instr. Co. | Chicago, Ill. | 78790 | Transformer Engineers | San Gabriel, Calif. | 84171 | Arco Electronics Inc. | Great Neck, N.Y. |
| 72619 | Dialight Corp. | Brooklyn, N.Y. | 78947 | Ucinite Co. | Newtonville, Mass. | 84396 | A.J. Glesener Co., Inc. | San Francisco, Calif. |
| 72656 | Indiana General Corp., Electronics Div. | Keasby, N.J. | 79136 | Waldes Kohinoor Inc. | Long Island City, N.Y. | 84411 | TRW Capacitor Div. | Ogallala, Neb. |
| 72699 | General Instrument Corp., Cap. Div. | Newark, N.J. | 79142 | Veeder Root, Inc. | Hartford, Conn. | 84970 | Sarkes Tarzian, Inc. | Bloomington, Ind. |
| 72765 | Drake Mfg. Co. | Chicago, Ill. | 79251 | Wenco Mfg. Co. | Chicago, Ill. | 85454 | Boonton Molding Company | Boonton, N.J. |
| 72825 | Hugh H. Eby Inc. | Philadelphia, Pa. | 79727 | Continental-Wirt Electronics Corp. | Philadelphia, Pa. | | | |
| 72928 | Gudeman Co. | Chicago, Ill. | 79963 | Zierick Mfg. Corp. | New Rochelle, N.Y. | | | |

From: FSC. Handbook Supplements
H4-1 Dated JULY 1965
H4-2 Dated NOV. 1962



| | | |
|-------|---|----------------------|
| 0000F | Malco Tool and Die | Los Angeles, Calif. |
| 0000M | Western Coil Div. of Automatic Ind., Inc. | Redwood City, Calif. |
| 0000Z | Willow Leather Products Corp. | Newark, N. J. |
| 000AA | British Radio Electronics Ltd. | Washington, D. C. |
| 000AB | ETA | England |
| 000BB | Precision Instrument Components Co. | Van Nuys, Calif. |
| 000MM | Rubber Eng. & Development | Hayward, Calif. |
| 000NN | A "N" D Mfg. Co. | San Jose, Calif. |
| 000QQ | Cooltron | Oakland, Calif. |
| 000WW | California Eastern Lab. | Burlington, Calif. |
| 000YY | S. K. Smith Co. | Los Angeles, Calif. |

SECTION VII

MANUAL CHANGES

7-1. MANUAL CHANGES.

7-2. CURRENT INSTRUMENTS.

7-3. This manual applies directly to standard Model 5255A Frequency Converter having the following serial prefix number (refer to Paragraph 1-9): 632, 640.

7-4. OLDER INSTRUMENTS.

7-5. This manual covers all instruments currently available. As instrument changes are made and this manual is revised, backdating information to cover older instruments will be included in this section.

7-6. NEWER INSTRUMENTS.

7-7. As changes are made in the Model 5255A, newer instruments may have serial prefix numbers not listed in this manual. The manuals for these instruments will be supplied with an additional "Manual Changes" sheet containing the required information; contact your nearest Hewlett-Packard sales and service office for information if this sheet is missing.

SECTION VIII

CIRCUIT DIAGRAMS

8-1. INTRODUCTION.

8-2. This section includes the following:

a. General Notes for Schematic Diagrams are given in Figure 8-1.

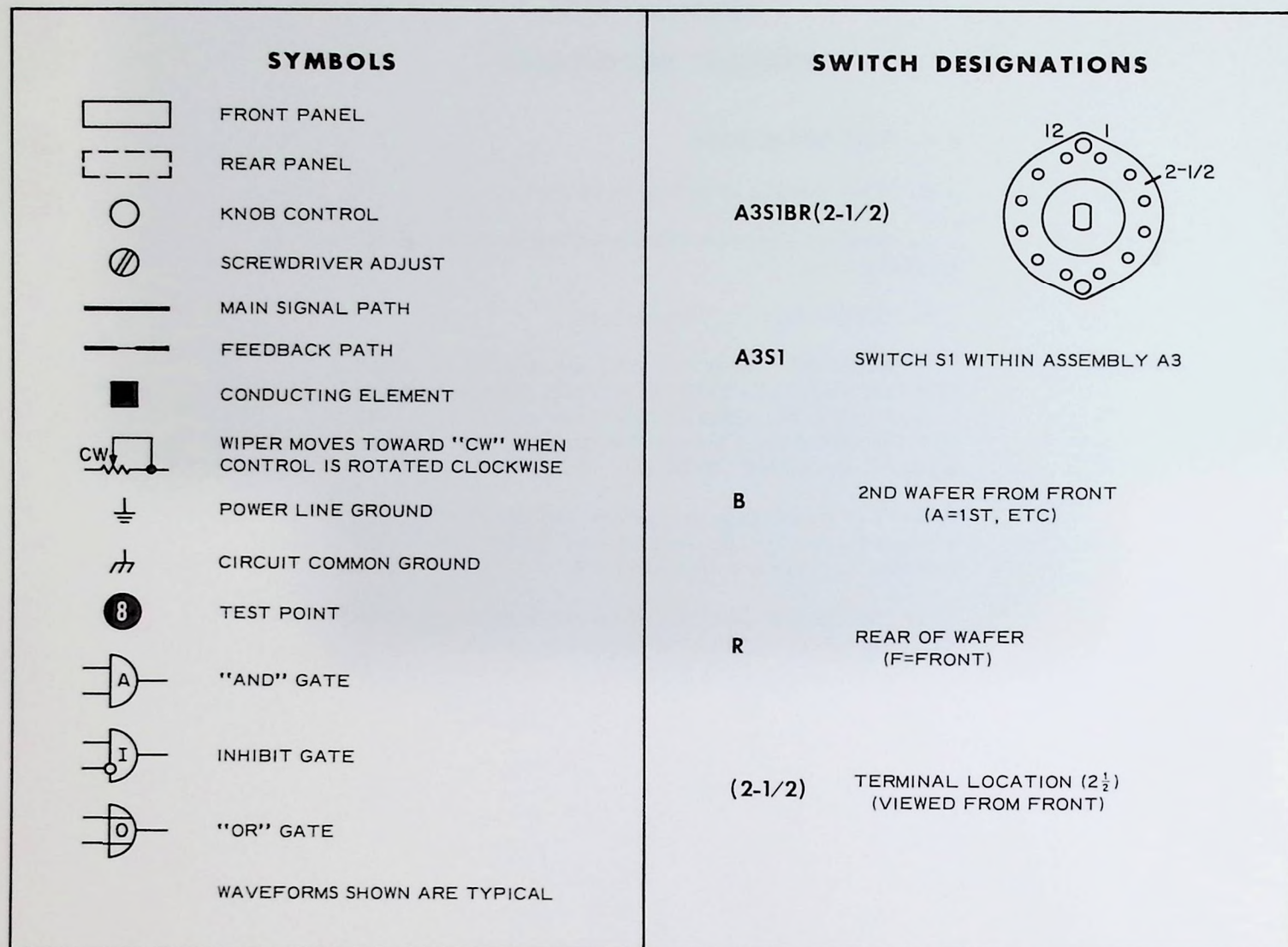
b. Block Diagram (Figure 8-2).

c. Schematic Diagrams and Component Location illustrations of Model 5255A circuits, assemblies and connectors in the order of their assembly designation (A1 through A10, Figures 8-3 through 8-8). These figures also include voltages.

8-3. The Block Diagram or any schematic diagram, when unfolded, can be used with any other part of this manual, or with the manual closed.

8-4. DC voltages are measured with a ϕ p Model 412A DC Voltmeter. Typical voltages are shown.

Figure 8-1. General Notes for Schematic Diagrams



REFERENCE DESIGNATIONS

REFERENCE DESIGNATIONS WITHIN ASSEMBLIES ARE ABBREVIATED.
ADD ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.

| <u>ASSEMBLY</u> | <u>ABBREVIATION</u> | <u>COMPLETE DESCRIPTION</u> |
|-----------------|---------------------|-----------------------------|
| A25 | C1 | A25C1 |
| A25A1 | CR1 | A25A1CR1 |
| NO PREFIX | J3 | J3 |

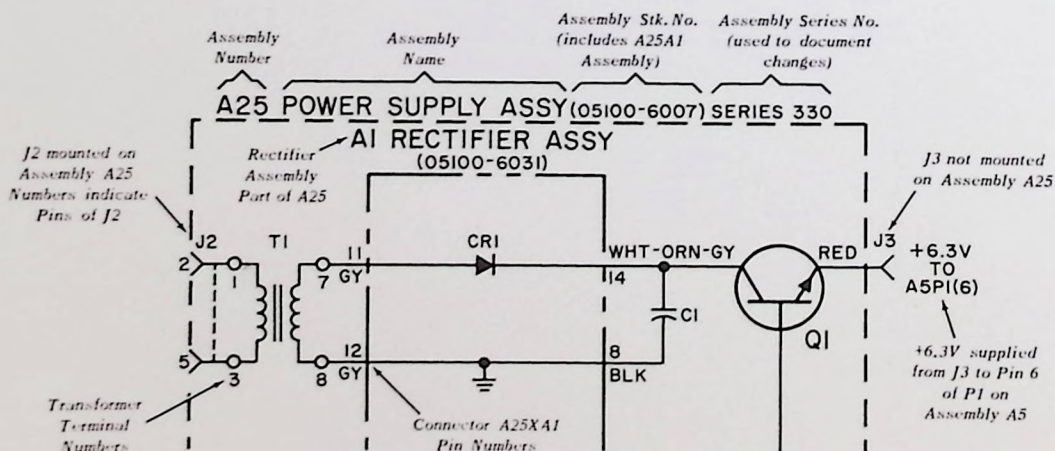


Figure 8-2

BLOCK DIAGRAM

8-3/8-4

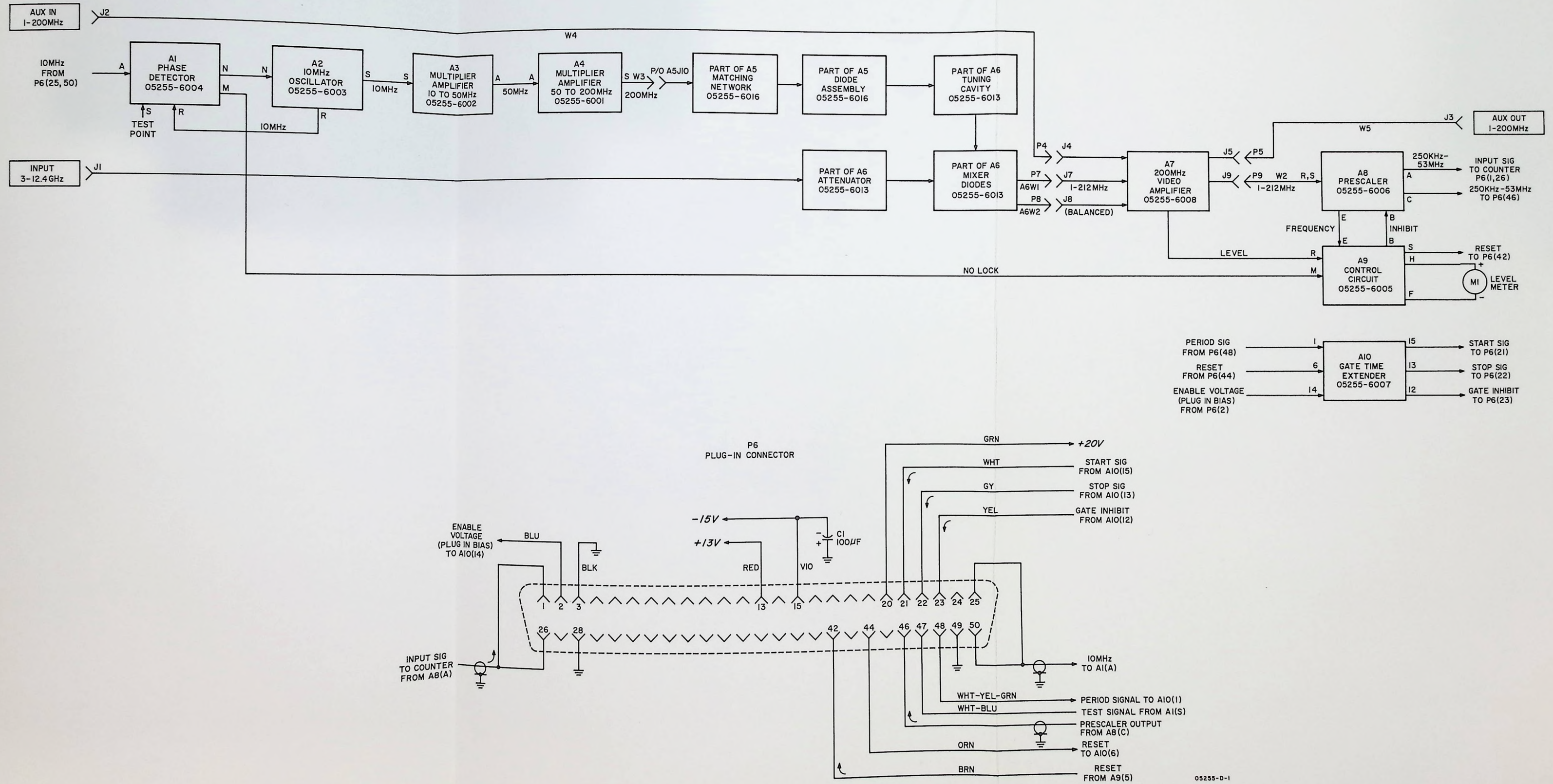
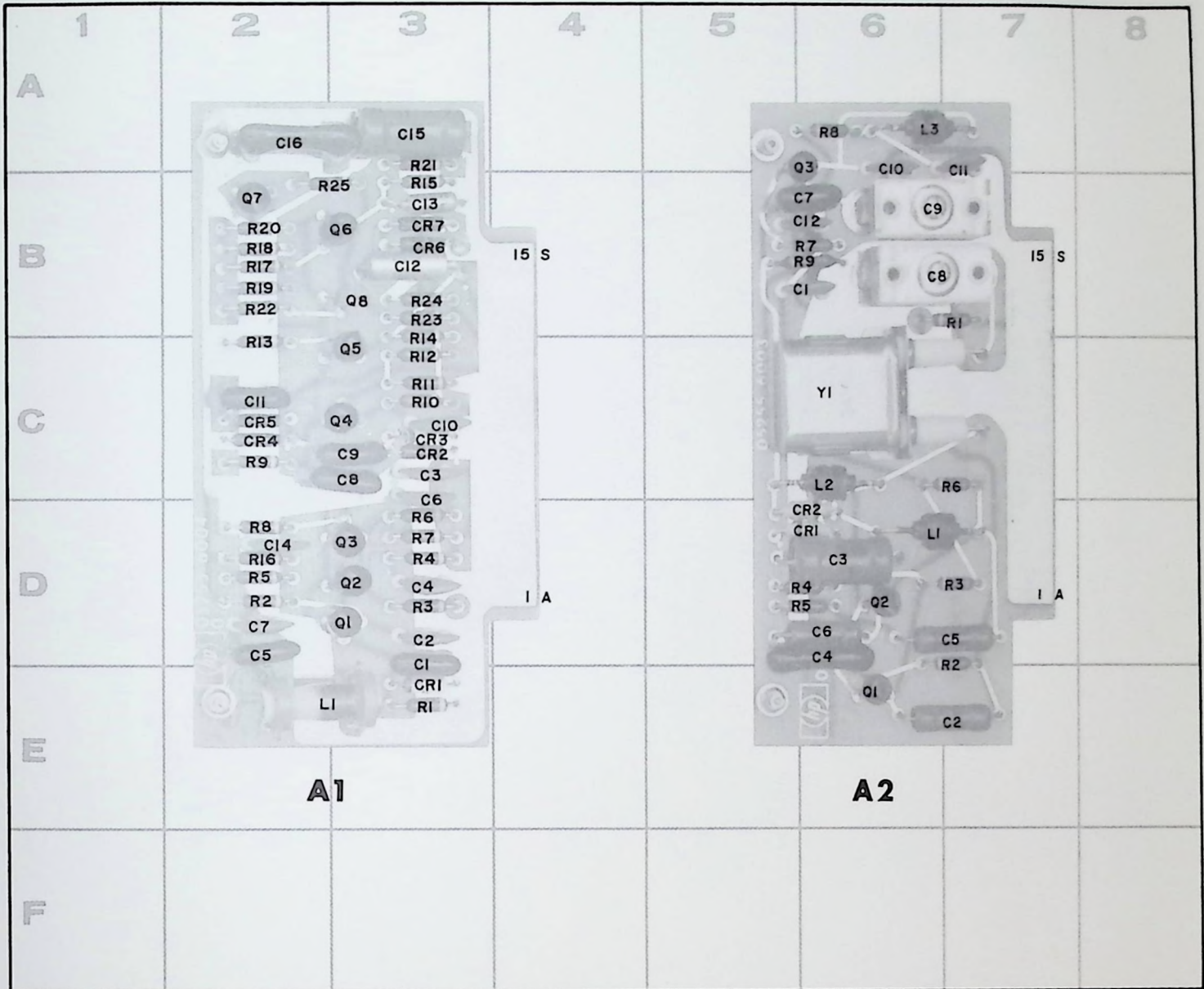


Figure 8-2. Block Diagram

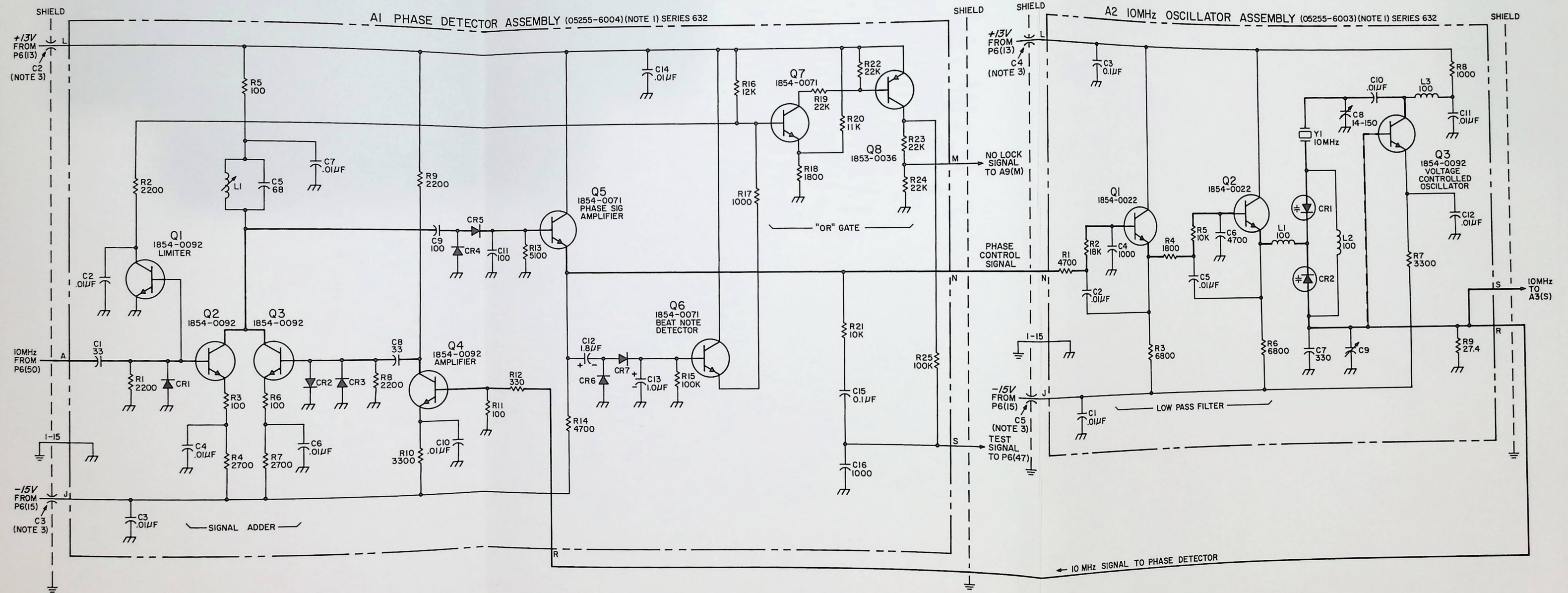


A1

A2

| | | |
|--------|-------|--------|
| C1-3E | L1-2E | R8-2D |
| C2-3D | | R9-2C |
| C3-3C | | R10-3C |
| C4-3D | Q1-3D | R11-3C |
| C5-2D | Q2-3D | R12-3C |
| C6-3D | Q3-3D | R13-2C |
| C7-2D | Q4-3C | R14-3C |
| C8-3C | Q5-3C | R15-3B |
| C9-3C | Q6-3B | R16-2D |
| C10-3C | Q7-2B | R17-2B |
| C11-2C | Q8-3B | R18-2B |
| C12-3B | | R19-2B |
| C13-3B | | R20-2B |
| C14-2D | R1-3E | R21-3A |
| C15-3A | R2-2D | R22-2B |
| C16-2A | R3-3D | R23-3B |
| | R4-3D | R24-3B |
| CR1-3E | R5-2D | R25-3B |
| CR2-3C | R6-3D | |
| CR3-3C | R7-3D | |
| CR4-2C | | |
| CR5-2C | | |
| CR6-3B | | |
| CR7-3B | | |

| | |
|--------|-------|
| C1-6B | Q1-6E |
| C2-7E | Q2-6D |
| C3-6D | Q3-6A |
| C4-6D | |
| C5-7D | |
| C6-6D | R1-7B |
| C7-6B | R2-7D |
| C8-6B | R3-7D |
| C9-6B | R4-6D |
| C10-6A | R5-6D |
| C11-7A | R6-7C |
| C12-6B | R7-6B |
| | R8-6A |
| | R9-6B |
| CR1-6D | |
| CR2-6D | |
| L1-6D | Y1-6C |
| L2-6C | |
| L3-6A | |



NOTES

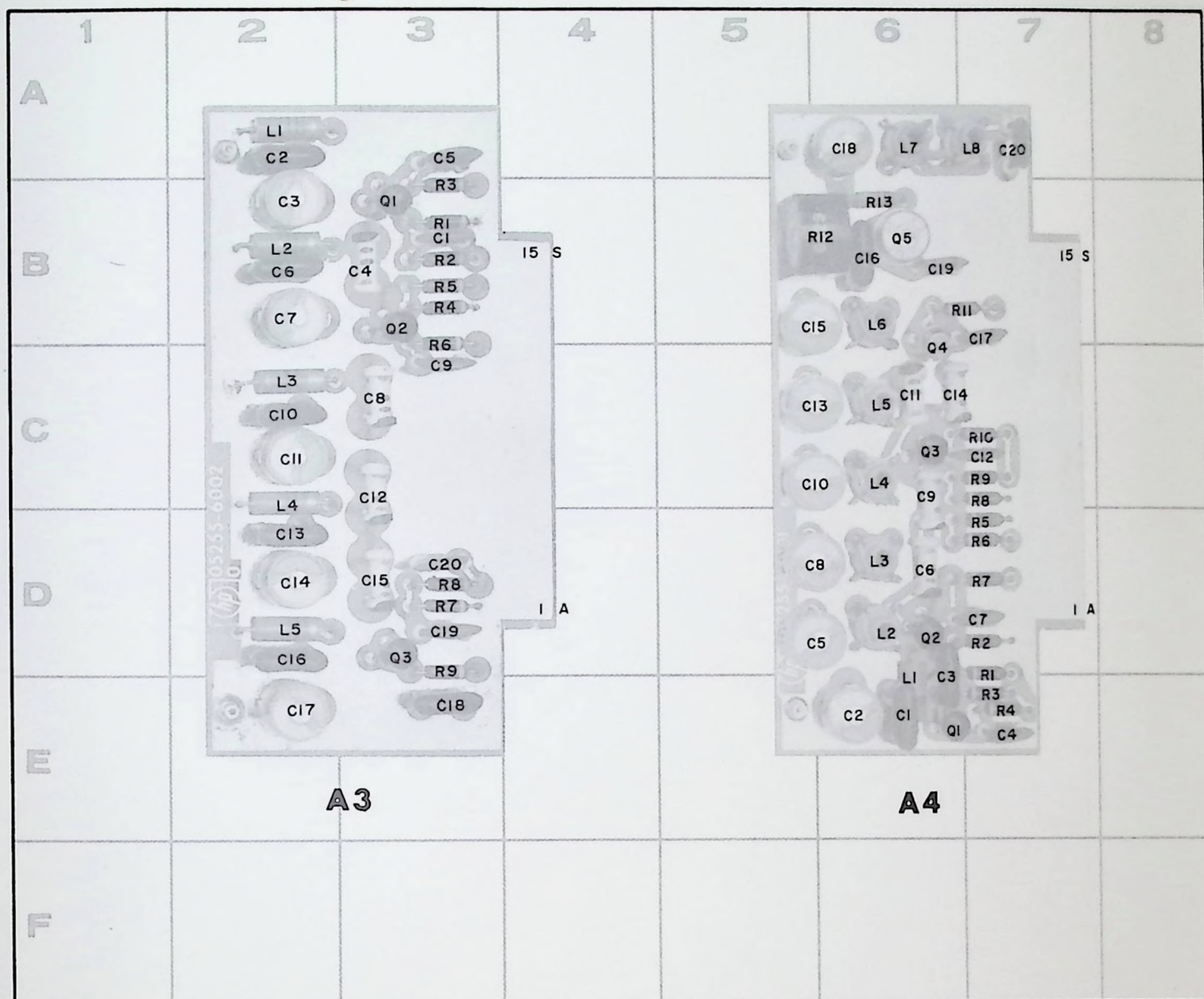
- REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY DESIGNATION AS PREFIX TO FORM COMPLETE DESIGNATION
- UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
- C2 THROUGH C5 ARE FEEDTHROUGH FILTER NETWORKS

REFERENCE DESIGNATIONS

| NO PREFIX | A1 | A2 |
|--------------|---|--|
| C2 - 5 | C1 - 16 CR1 - 7 L1 - 3 Q1 - 8 R1 - 25 | C1 - 12 CR1,2 - 3 Q1 - 3 R1 - 9 Y1 |

COPYRIGHT 1967 BY HEWLETT-PACKARD COMPANY
05255-0-2

Figure 8-3. Phase Detector Assembly A1
10 MHz Oscillator Assembly A2

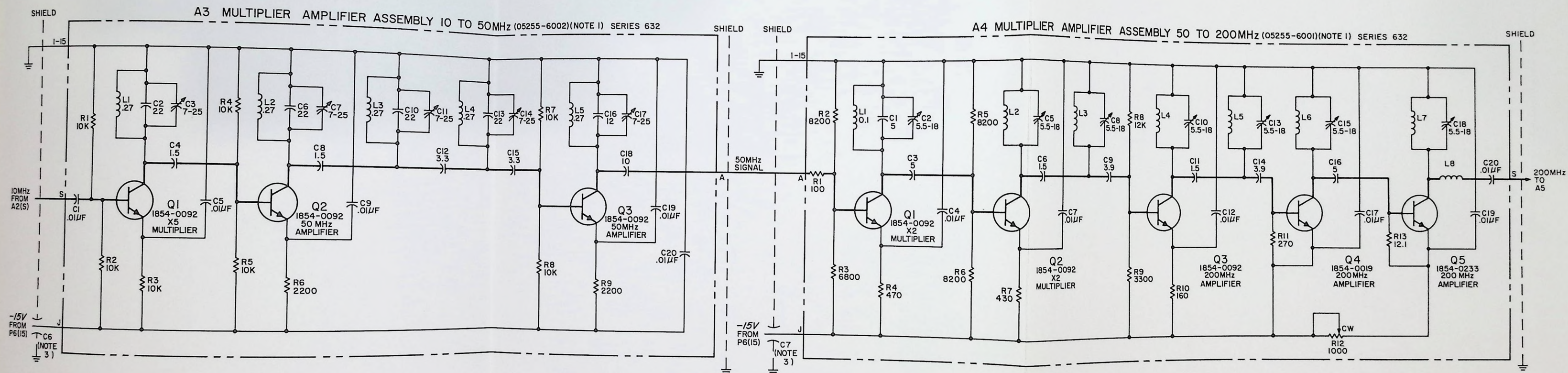


A3

| | |
|--------|-------|
| C1-3B | L1-2A |
| C2-2A | L2-2B |
| C3-2B | L3-2C |
| C4-3B | L4-2C |
| C5-3A | L5-2D |
| C6-2B | |
| C7-2B | Q1-3B |
| C8-3C | Q2-3B |
| C9-3C | Q3-3D |
| C10-2C | |
| C11-2C | R1-3B |
| C12-3C | R2-3B |
| C13-2D | R3-3B |
| C14-2D | R4-3B |
| C15-3D | R5-3B |
| C16-2D | R6-3C |
| C17-2E | R7-3D |
| C18-3D | R8-3D |
| C19-3D | R9-3D |
| C20-3D | |

A4

| | | |
|--------|-------|--------|
| C1-6E | L1-6E | R1-7E |
| C2-6E | L2-6D | R2-7D |
| C3-6E | L3-6D | R3-7E |
| C4-7E | L4-6C | R4-7E |
| C5-5D | L5-6C | R5-7D |
| C6-6D | L6-6B | R6-7D |
| C7-7D | L7-6A | R7-7D |
| C8-5D | L8-7A | R8-7C |
| C9-6C | | R9-7C |
| C10-5C | | R10-7C |
| C11-6C | Q1-6E | R11-7B |
| C12-7C | Q2-6D | R12-6B |
| C13-5C | Q3-6C | R13-6B |
| C14-6C | Q4-6C | |
| C15-5B | Q5-6B | |
| C16-6B | | |
| C17-7B | | |
| C18-6A | | |
| C19-6B | | |
| C20-7A | | |



NOTES

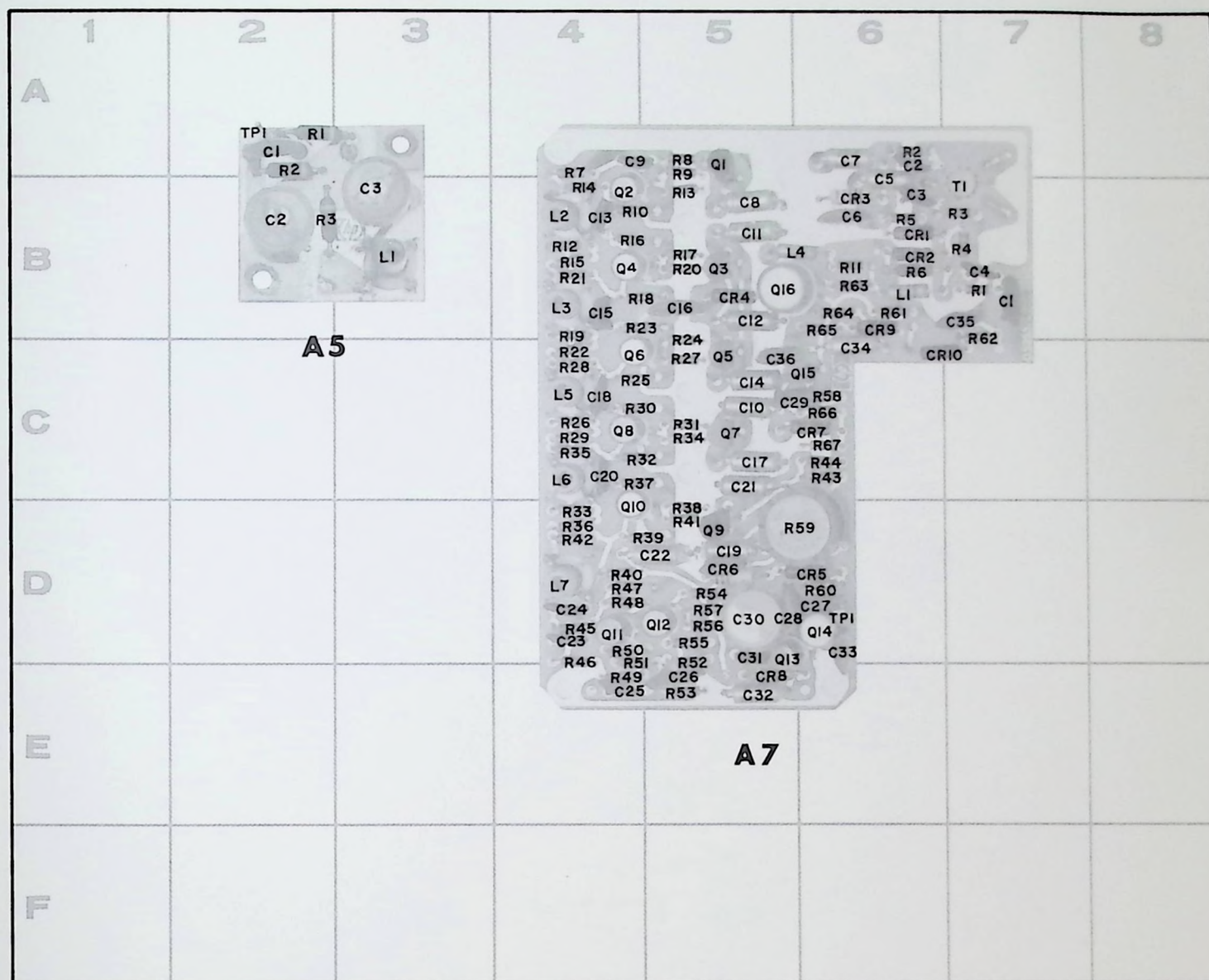
1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY DESIGNATION AS PREFIX TO FORM COMPLETE DESIGNATION
2. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
3. C6 AND C7 ARE FEED THROUGH FILTER NETWORKS.

REFERENCE DESIGNATIONS

| NO PREFIX | A3 | A4 |
|--------------|-------------------------------|--------------------------------|
| C6,7 | C1-20 L1-5 Q1-3 R1-9 | C1-20 L1-8 Q1-5 R1-13 |

COPYRIGHT 1967 BY HEWLETT-PACKARD COMPANY
05255-D-3

Figure 8-4. 50 MHz Multiplier/Amplifier Assembly A3
200 MHz Multiplier/Amplifier Assembly A4



A7

| | | | | | | | |
|--------|--------|---------|--------|--------|--------|--------|--------|
| C1-7B | C19-5D | CR1-6B | Q1-5A | R1-7B | R17-5B | R35-4C | R53-5E |
| C2-6A | C20-4C | CR2-6B | Q2-4B | R2-6A | R18-4B | R36-4D | R54-5D |
| C3-6B | C21-5C | CR3-6B | Q3-5B | R3-7B | R19-4B | R37-4C | R55-5D |
| C4-7B | C22-5D | CR4-5B | Q4-4B | R4-7B | R20-5B | R38-5D | R56-5D |
| C5-6B | C23-4D | CR5-6D | Q5-5C | R5-6B | R21-4B | R39-5D | R57-5D |
| C6-6B | C24-4D | CR6-5D | Q6-4C | R6-6B | R22-4C | R40-4D | R58-6C |
| C7-6A | C25-4E | CR7-6C | Q7-5C | R7-4A | R23-5B | R41-5D | R59-6D |
| C8-5B | C26-5E | CR8-5E | Q8-4C | R8-5A | R24-5C | R42-4D | R60-6D |
| C9-4A | C27-6D | CR9-6B | Q9-5D | R9-5A | R25-4C | R43-6C | R61-6B |
| C10-5C | C28-5D | CR10-7C | Q10-4D | R10-4B | R26-4C | R44-6C | R62-7B |
| C11-5B | C29-6C | | Q11-4D | R11-6B | R27-5C | R45-4D | R63-6B |
| C12-5B | C30-5D | L1-6B | Q12-5D | R12-4B | R28-4C | R46-4E | R64-6B |
| C13-4B | C31-5D | L2-4B | Q13-5D | R13-6B | R29-4C | R47-4D | R65-6B |
| C14-5C | C32-5E | L3-4B | Q14-6D | R14-4B | R30-4C | R48-4D | R66-6C |
| C15-4B | C33-6D | L4-6B | Q15-6C | R15-4B | R31-5C | R49-4E | R67-6C |
| C16-5B | C34-6C | L5-4C | Q16-5B | R16-4B | R32-4C | R50-4D | |
| C17-5C | C35-7B | L6-4C | | | R33-4D | R51-4E | T1-7B |
| C18-4C | C36-5C | L7-4D | | | R34-5C | R52-5E | TP1-6D |

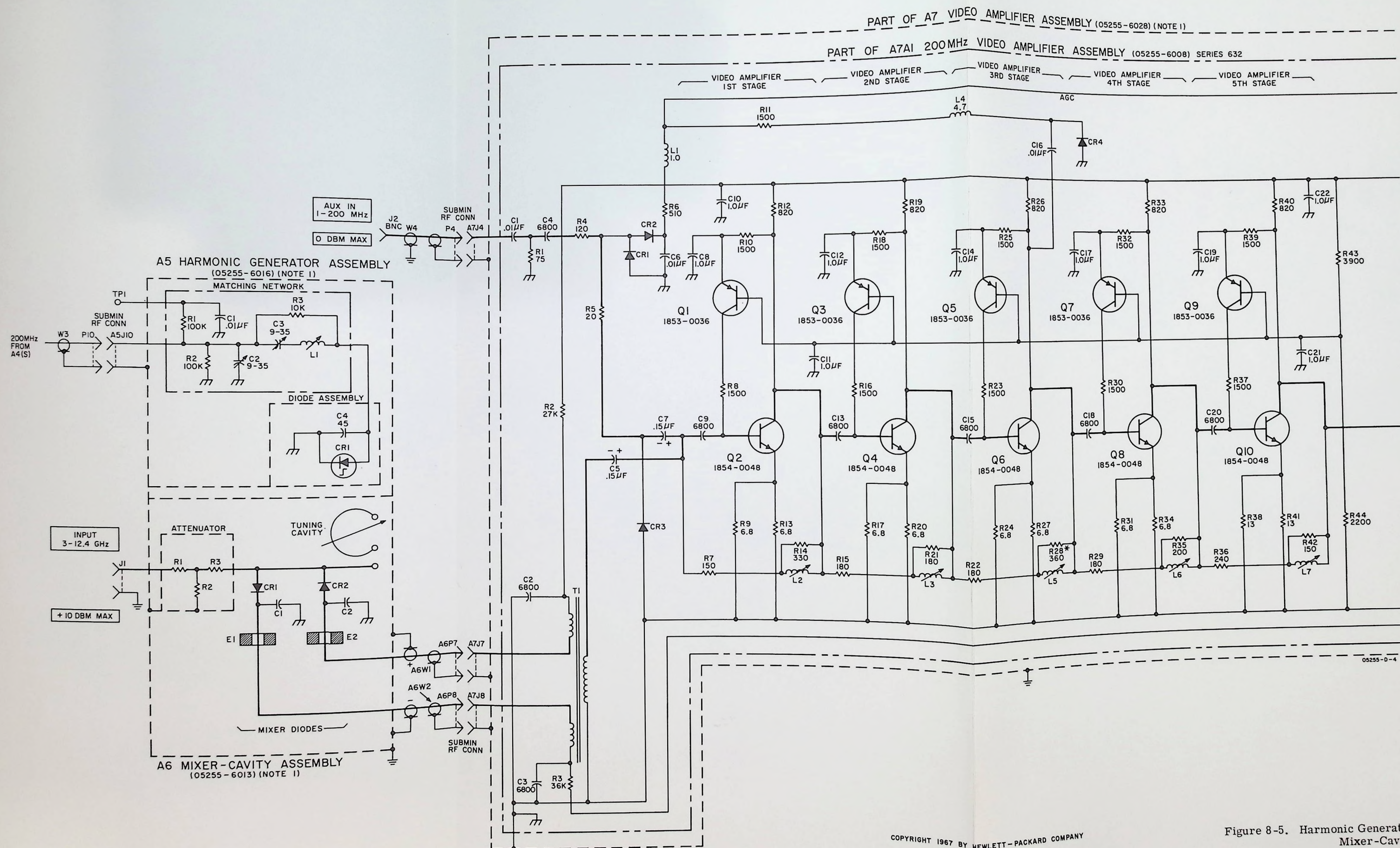
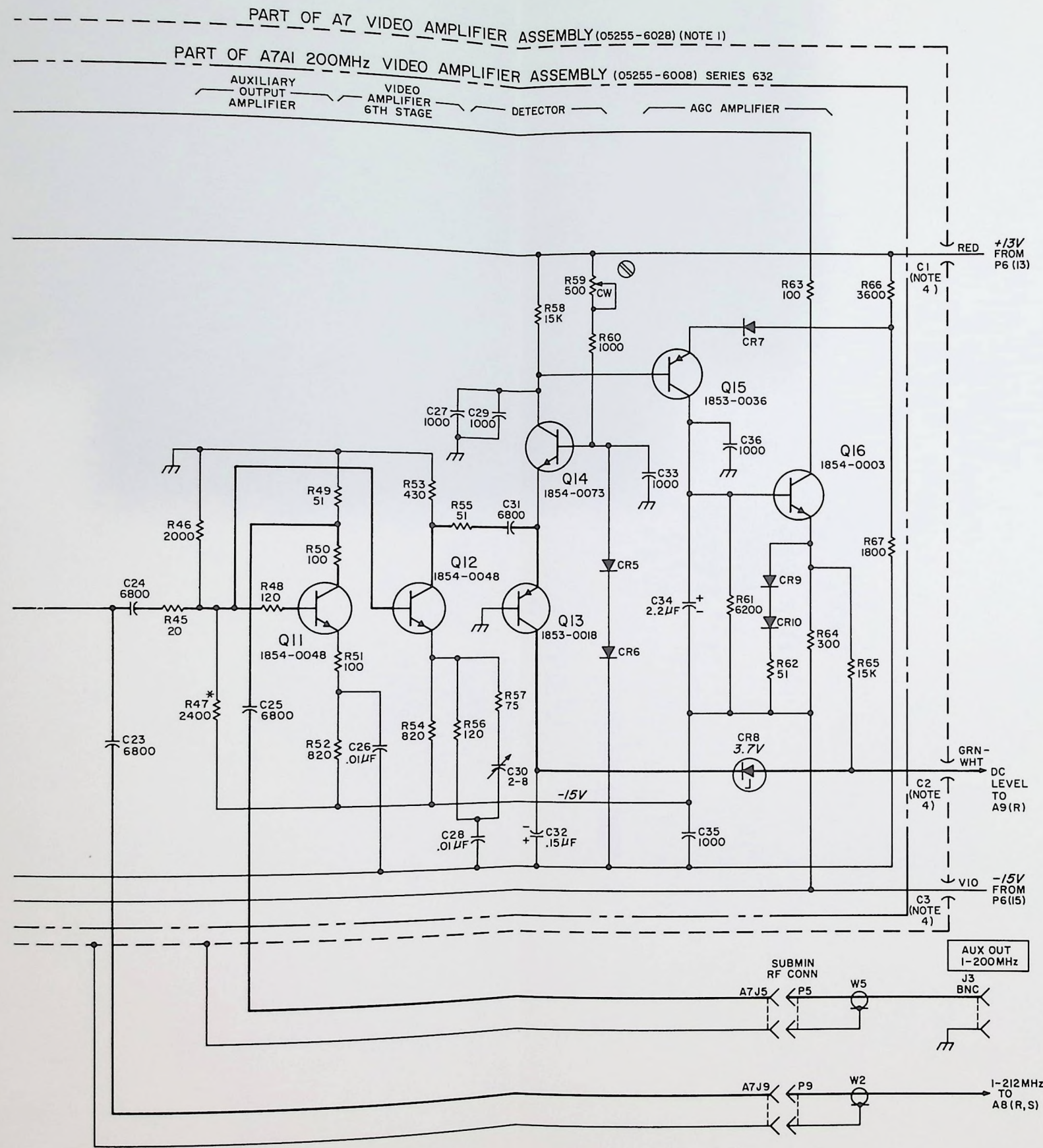


Figure 8-5. Harmonic Generator Assembly A5
Mixer-Cavity Assembly A6
Video Amplifier Assembly A7
(Sheet 1 of 2)

Figure 8-5
HARMONIC GENERATOR ASSEMBLY A5
MIXER-CAVITY ASSEMBLY A6
VIDEO AMPLIFIER ASSEMBLY A7
(Sheet 2 of 2)
8-11/8-12



NOTES

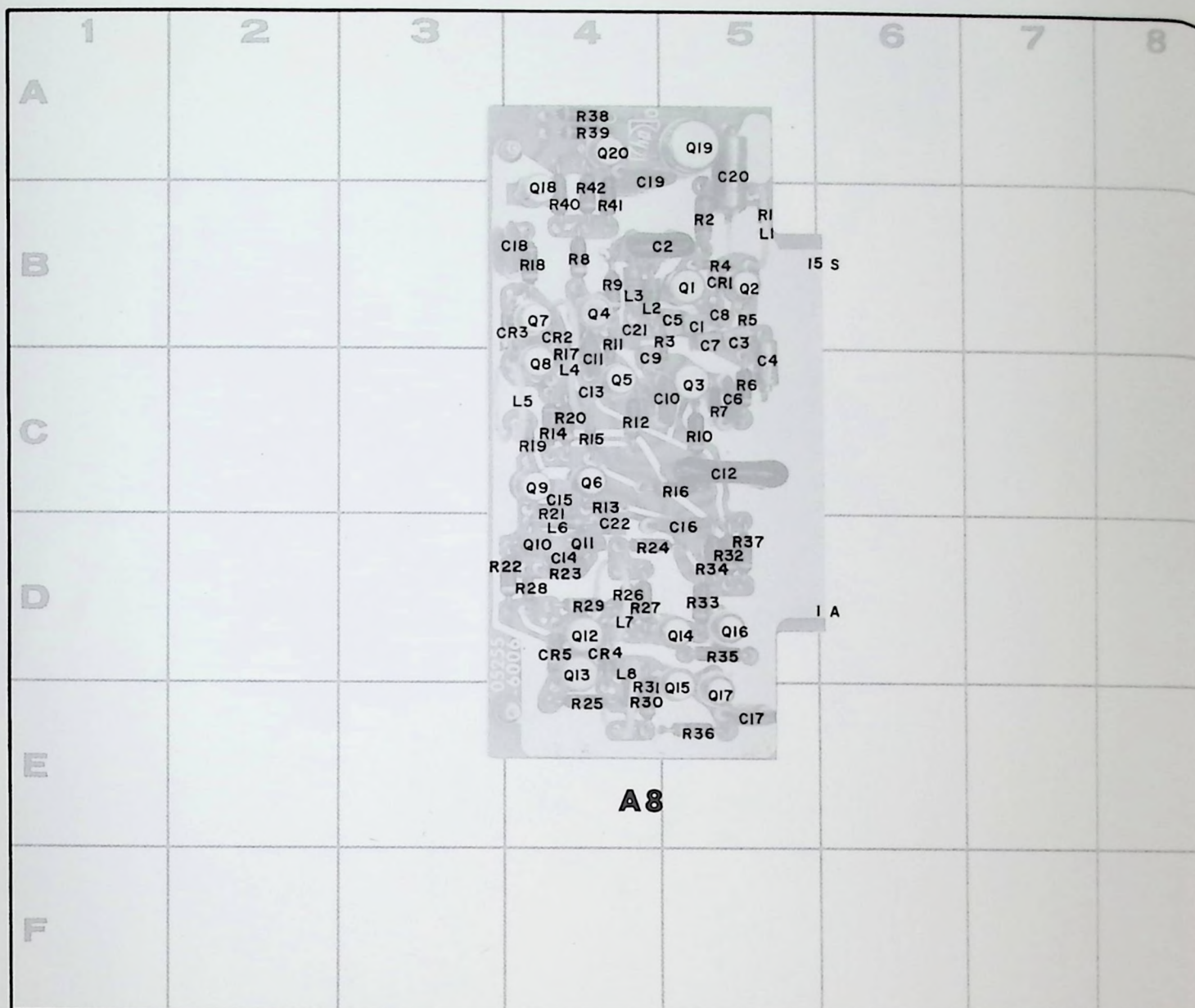
1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY DESIGNATION AS PREFIX TO FORM COMPLETE DESIGNATION
2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN PICOFARADS; INDUCTANCE IN MICROHENRIES
3. ASTERISK (*) INDICATES SELECTED COMPONENT, AVERAGE VALUES SHOWN
4. A7C1 THRU A7C3 ARE FEED THROUGH FILTER NETWORKS

REFERENCE DESIGNATIONS

| NO PREFIX | A5 | A6 | A7A1 | A7 |
|---------------|-------------|-----------------------|----------------------|----------|
| J1-3 | C1-4 CR1 | C1,2 CR1,2 E1,2 | C1-36 CR1-10 | C1-3 |
| P4,5, 7-10 | J10 L1 | P7,8 | L1-7 | J4,5,7,9 |
| W2-5 | R1-3 TPI | R1-3 W1,2 | Q1-16 R1-67 T1 | |

COPYRIGHT 1967 BY HEWLETT-PACKARD COMPANY
05255-0-8

Figure 8-5. Harmonic Generator Assembly A5
Mixer-Cavity Assembly A6
Video Amplifier Assembly A7
(Sheet 2 of 2)



A8

| | | | | |
|----------|----------|----------|----------|----------|
| C1 - 5B | CR1 - 5B | Q1 - 5B | R1 - 5B | R22 - 3D |
| C2 - 4B | CR2 - 4B | Q2 - 5B | R2 - 5B | R23 - 4D |
| C3 - 5B | CR3 - 4B | Q3 - 5C | R3 - 5B | R24 - 4D |
| C4 - 5C | CR4 - 4D | Q4 - 4B | R4 - 5B | R25 - 4E |
| C5 - 5B | CR5 - 4D | Q5 - 4C | R5 - 5B | R26 - 4D |
| C6 - 5C | | Q6 - 4C | R6 - 5C | R27 - 4D |
| C7 - 5B | | Q7 - 4B | R7 - 5C | R28 - 4D |
| C8 - 5B | | Q8 - 4C | R8 - 4B | R29 - 4D |
| C9 - 4C | L1 - 5B | Q9 - 4C | R9 - 4B | R30 - 4E |
| C10 - 5C | L2 - 4B | Q10 - 4D | R10 - 5C | R31 - 4E |
| C11 - 4C | L3 - 4B | Q11 - 4D | R11 - 4B | R32 - 5D |
| C12 - 5C | L4 - 4C | Q12 - 4D | R12 - 4C | R33 - 5D |
| C13 - 4C | L5 - 4C | Q13 - 4D | R13 - 4C | R34 - 5D |
| C14 - 4D | L6 - 4D | Q14 - 5D | R14 - 4C | R35 - 5D |
| C15 - 4C | L7 - 4D | Q15 - 5E | R15 - 4C | R36 - 5E |
| C16 - 5D | L8 - 4E | Q16 - 5D | R16 - 5C | R37 - 5D |
| C17 - 5E | | Q17 - 5E | R17 - 4C | R38 - 4A |
| C18 - 3B | | Q18 - 4B | R18 - 4B | R39 - 4A |
| C19 - 4A | | Q19 - 5A | R19 - 4C | R40 - 4B |
| C20 - 5A | | Q20 - 4A | R20 - 4C | R41 - 4B |
| C21 - 4B | | | R21 - 4D | R42 - 4B |
| C22 - 4D | | | | |

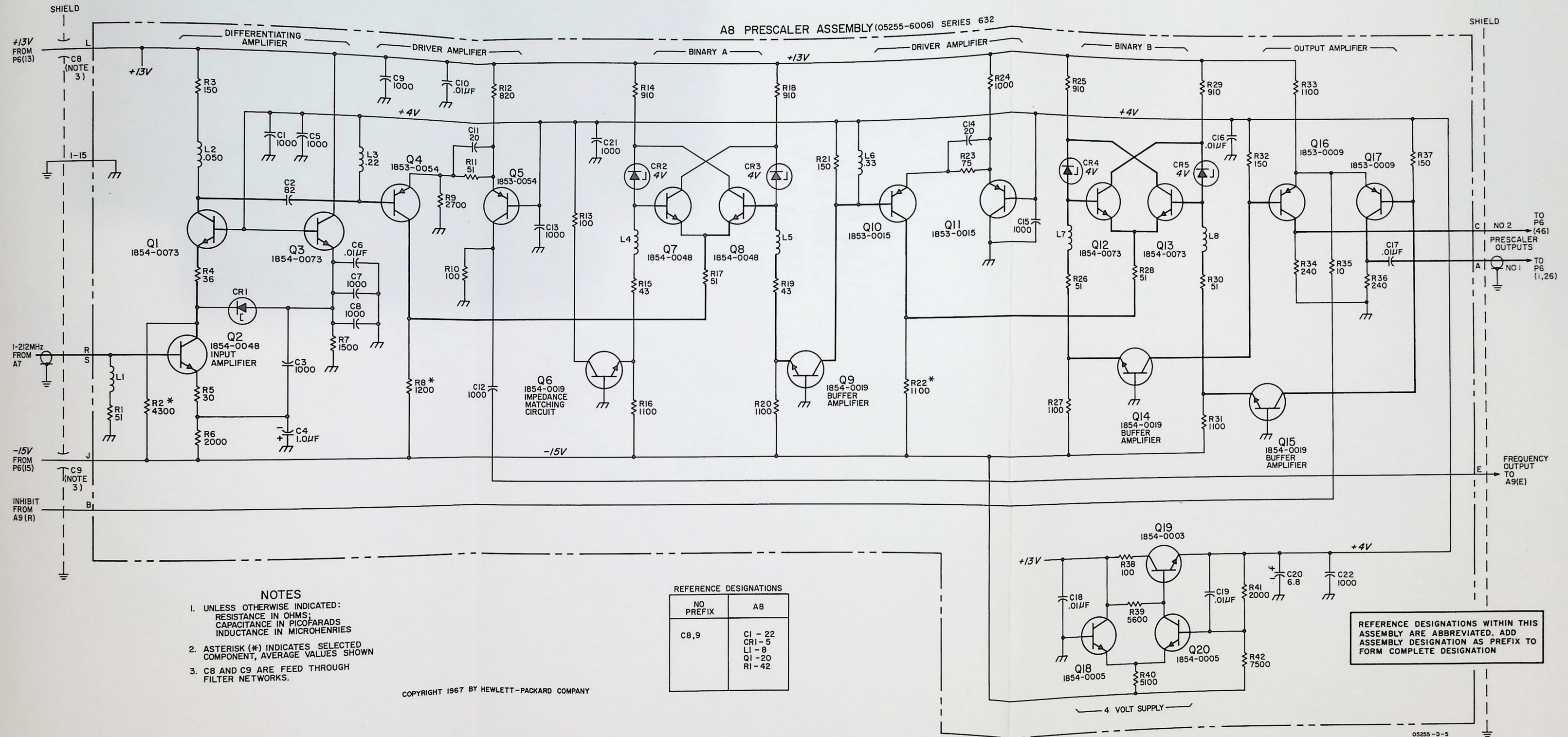
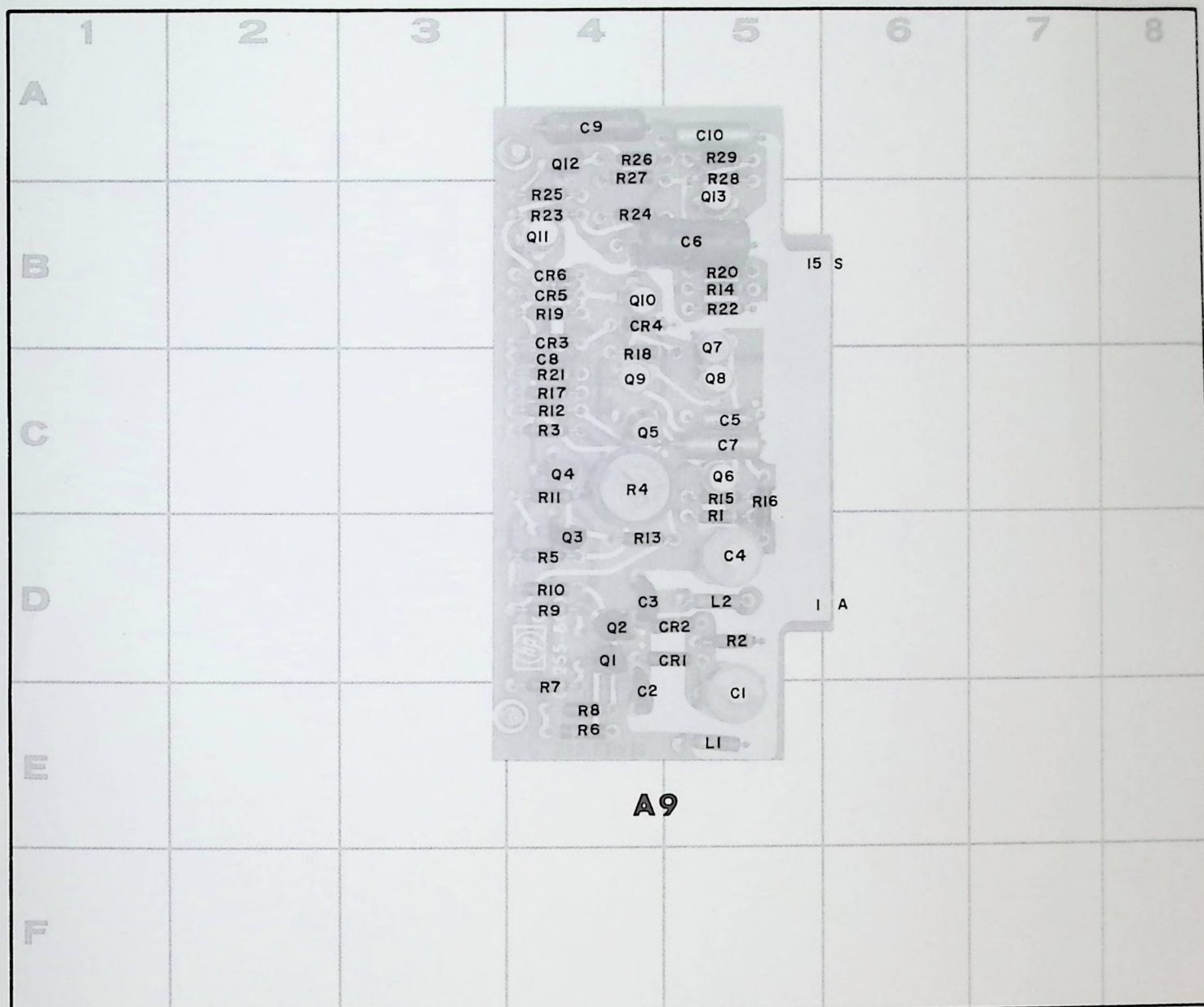


Figure 8-6. Prescaler Assembly A8



A9

A9

C1 - 5E
C2 - 4E
C3 - 4D
C4 - 5D
C5 - 5C
C6 - 5B
C7 - 5C
C8 - 4C
C9 - 4A
C10 - 5A

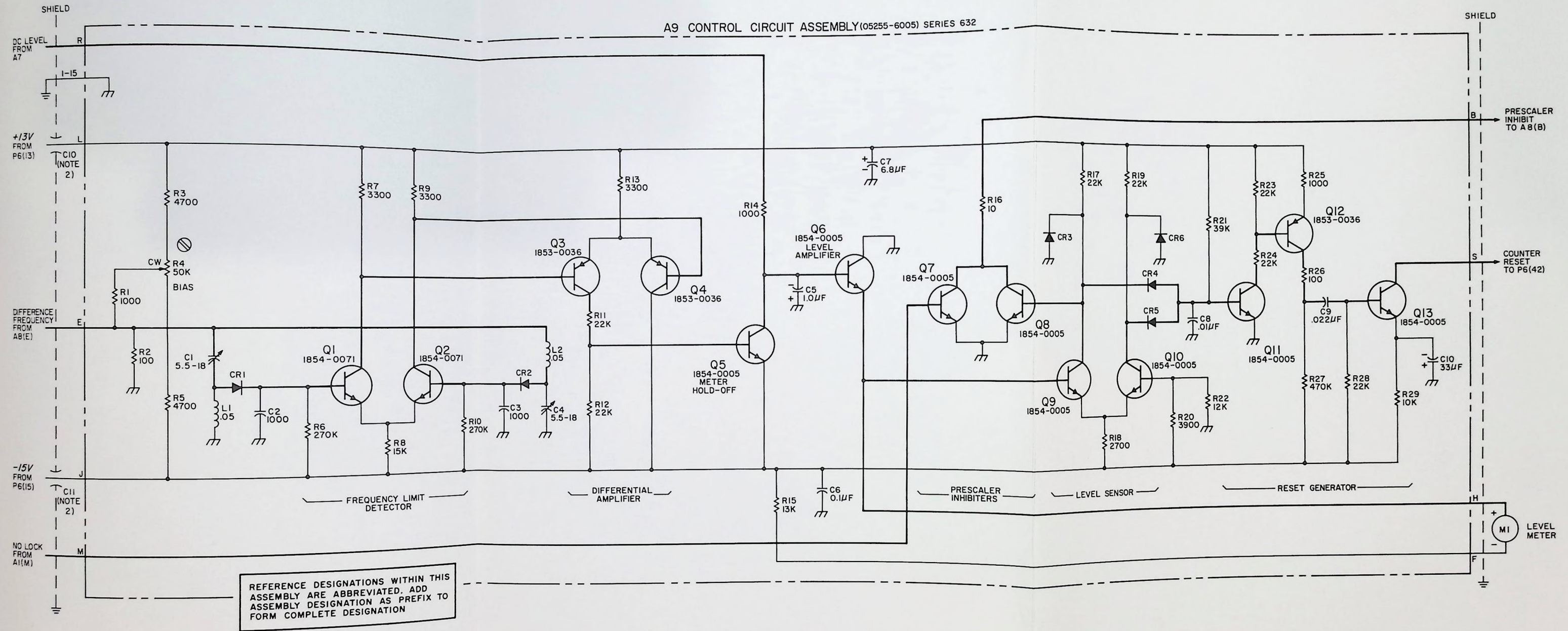
CR1 - 5D
CR2 - 5D
CR3 - 4B
CR4 - 4B
CR5 - 4B
CR6 - 4B

L1 - 5E
L2 - 5D

Q1 - 4D
Q2 - 4D
Q3 - 4D
Q4 - 4C
Q5 - 4C
Q6 - 5C
Q7 - 5C
Q8 - 5C
Q9 - 4C
Q10 - 4B
Q11 - 4B
Q12 - 4A
Q13 - 5B

R1 - 5D
R2 - 5D
R3 - 4C
R4 - 4C
R5 - 4D
R6 - 4E
R7 - 4E
R8 - 4E
R9 - 4D
R10 - 4D
R11 - 4C
R12 - 4C
R13 - 4D
R14 - 5B
R15 - 5C

R16 - 5C
R17 - 4C
R18 - 4C
R19 - 4B
R20 - 5B
R21 - 4C
R22 - 5B
R23 - 4B
R24 - 4B
R25 - 4B
R26 - 4A
R27 - 4A
R28 - 5A
R29 - 5A



NOTES

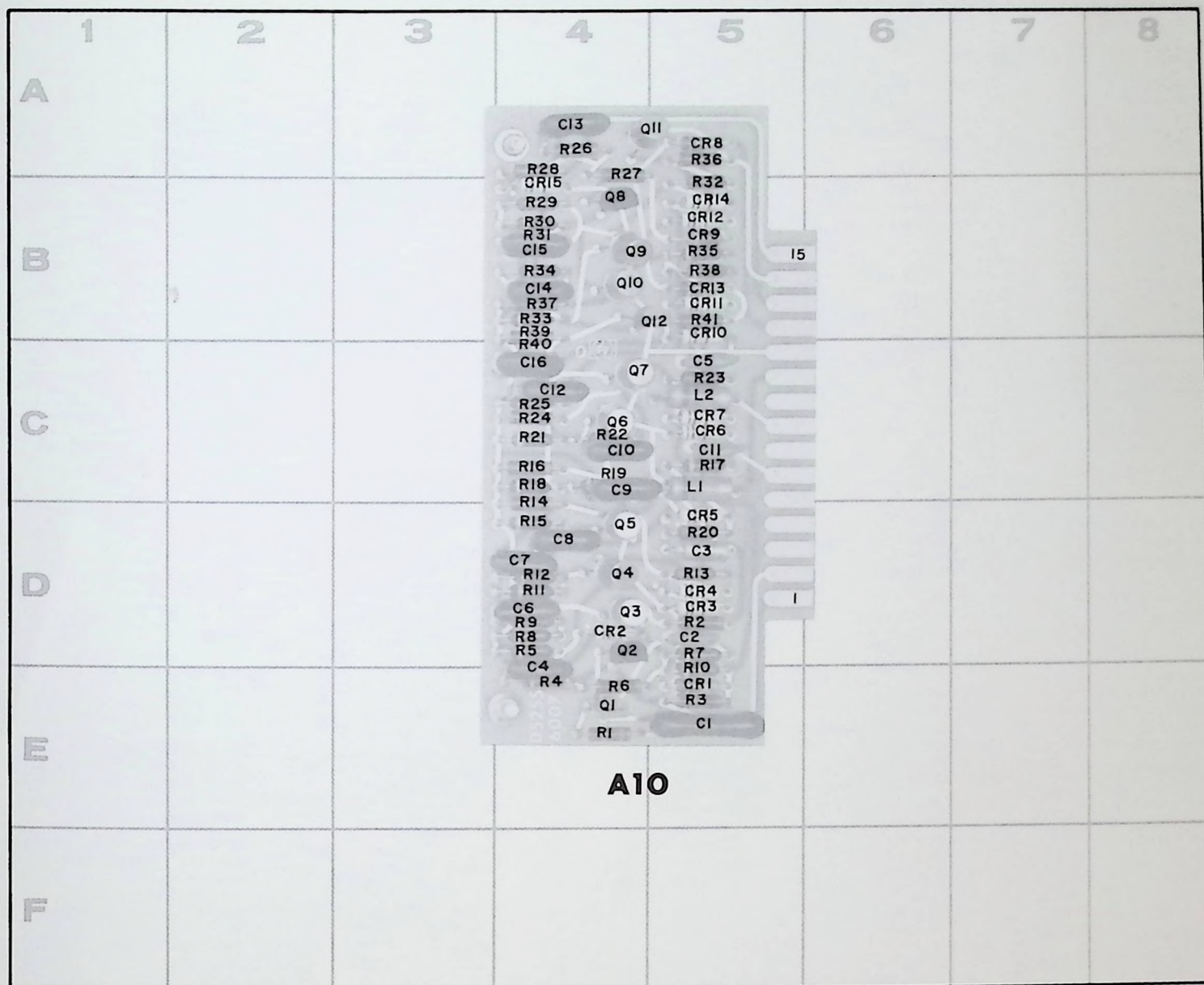
1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
2. C10 AND C11 ARE FEED THROUGH
FILTER NETWORKS.

REFERENCE DESIGNATIONS

| NO PREFIX | A9 |
|--------------|-----------------------------|
| C10, 11 | C1 - 10 CR1 - 6 L1, 2 |
| M1 | Q1 - 13 R1 - 29 |

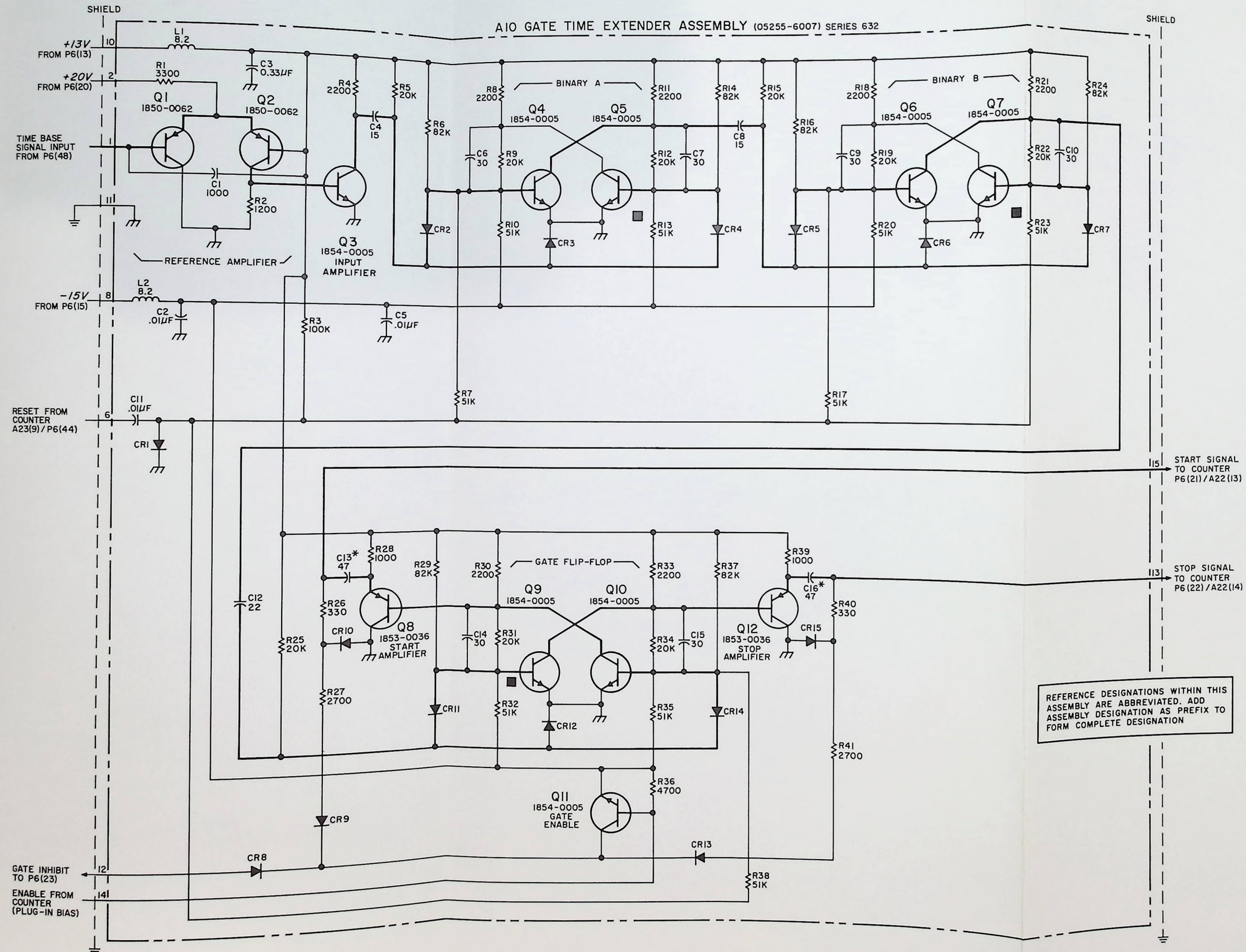
COPYRIGHT 1967 BY HEWLETT-PACKARD COMPANY
05255-D-6

Figure 8-7. Control Circuit Assembly A9



A10

| | | | | |
|----------|-----------|----------|----------|----------|
| C1 - 5E | CR1 - 5E | Q1 - 4E | R8 - 4D | R26 - 4A |
| C2 - 5D | CR2 - 4D | Q2 - 4D | R9 - 4D | R27 - 4A |
| C3 - 5D | CR3 - 5D | Q3 - 4D | R10 - 5E | R28 - 4A |
| C4 - 4E | CR4 - 5D | Q4 - 4D | R11 - 4D | R29 - 4B |
| C5 - 5C | CR5 - 5D | Q5 - 4D | R12 - 4D | R30 - 4B |
| C6 - 4D | CR6 - 5C | Q6 - 4C | R13 - 5D | R31 - 4B |
| C7 - 4D | CR7 - 5C | Q7 - 4C | R14 - 4D | R32 - 5B |
| C8 - 4D | CR8 - 5A | Q8 - 4B | R15 - 4D | R33 - 4B |
| C9 - 4C | CR9 - 5B | Q9 - 4B | R16 - 4C | R34 - 4B |
| C10 - 4C | CR10 - 5B | Q10 - 4B | R17 - 5C | R35 - 5B |
| C11 - 5C | CR11 - 5B | Q11 - 4A | R18 - 4C | R36 - 5A |
| C12 - 4C | CR12 - 5B | Q12 - 4B | R19 - 4C | R37 - 4B |
| C13 - 4A | CR13 - 5B | | R20 - 5D | R38 - 5B |
| C14 - 4B | CR14 - 5B | R1 - 4E | R21 - 4C | R39 - 4B |
| C15 - 4B | CR15 - 4B | R2 - 5D | R22 - 4C | R40 - 4C |
| C16 - 4C | | R3 - 5E | R23 - 5C | R41 - 5C |
| | L1 - 5C | R4 - 4E | R24 - 4C | |
| | L2 - 5C | R5 - 4D | R25 - 4C | |
| | | R6 - 4E | | |
| | | R7 - 5D | | |



COPYRIGHT 1967 BY HEWLETT-PACKARD COMPANY
05255-0-7

Figure 8-8. Gate Time Extender Assembly A10
8-17/8-18



ELECTRONIC INSTRUMENTATION SALES AND SERVICE UNITED STATES, CANADA, CENTRAL AND SOUTH AMERICA

UNITED STATES

ALABAMA

P.O. Box 4207
2003 Byrd Spring Road S.W.
Huntsville 35802
TWX: 510-579-2204
Tel: (205) 881-4591

ARIZONA

3009 North Scottsdale Road
Scottsdale 85251
Tel: (602) 945-7601
TWX: 910-950-1282

232 South Tucson Boulevard
Tucson 85716
Tel: (602) 623-2564
TWX: 910-952-1162

CALIFORNIA

3939 Lankershim Boulevard
North Hollywood 91604
Tel: (213) 877-1282
TWX: 910-499-2170

1101 Embarcadero Road
Palo Alto 94303
Tel: (415) 327-6500
TWX: 910-373-1280

2591 Carlsbad Avenue
Sacramento 95821
Tel: (916) 482-1463
TWX: 910-367-2092

1055 Shafter Street
San Diego 92106
Tel: (714) 223-8103
TWX: 910-335-2000

COLORADO

7965 East Prentice
Englewood 80110
Tel: (303) 771-3455
TWX: 910-935-0705

CONNECTICUT

508 Tolland Street
East Hartford 06108
Tel: (203) 289-9394
TWX: 710-425-3416

111 East Avenue
Norwalk 06851
Tel: (203) 853-1251
TWX: 710-468-3750

DELAWARE

3941 Kennett Pike
Wilmington 19807
Tel: (302) 655-6161
TWX: 510-666-2214

FLORIDA

Suite 106
9999 N.E. 2nd Avenue
Miami Shores 33138
Tel: (305) 758-3626
TWX: 810-848-7262

P.O. Box 20007
Herndon Station 32814
621 Commonwealth Avenue
Orlando
Tel: (305) 841-3970
TWX: 810-850-0113

P.O. Box 8128
Madeira Beach 33708
410 150th Avenue
St. Petersburg
Tel: (813) 391-0211
TWX: 810-863-0366

GEORGIA

3110 Maple Drive N.E.
Atlanta 30305
Tel: (404) 233-1141
TWX: 810-751-3283

ILLINOIS

5500 Howard Street
Skokie 60076
Tel: (312) 677-0400
TWX: 910-223-3613

INDIANA

4002 Meadows Drive
Indianapolis 46205
Tel: (317) 546-4891
TWX: 810-341-3263

LOUISIANA

P.O. Box 856
1942 Williams Boulevard
Kenner 70062
Tel: (504) 721-6201
TWX: 810-955-5524

MARYLAND

6707 Whitestone Road
Baltimore 21207
Tel: (301) 944-5400
TWX: 710-862-0850

MARYLAND

P.O. Box 727
Twinbrook Station 20851
12303 Twinbrook Parkway
Rockville
Tel: (301) 427-7560
TWX: 710-828-9684

MARYLAND

6707 Whitestone Road
Baltimore 21207
Tel: (301) 944-5400
TWX: 710-862-0850

MARYLAND

P.O. Box 727
Twinbrook Station 20851
12303 Twinbrook Parkway
Rockville
Tel: (301) 427-7560
TWX: 710-828-9684

MASSACHUSETTS

Middlesex Turnpike
Burlington 01803
Tel: (617) 272-9000
TWX: 710-332-0382

MICHIGAN

24315 Northwestern Highway
Southfield 48076
Tel: (313) 353-9100
TWX: 810-232-1532

MINNESOTA

2459 University Avenue
St. Paul 55114
Tel: (612) 646-7881
TWX: 910-563-3734

MISSOURI

9208 Wyoming Place
Kansas City 64114
Tel: (816) 333-2445
TWX: 910-771-2087

2812 South Brentwood Blvd.
St. Louis 63144
Tel: (314) 644-0220
TWX: 910-760-1670

NEW JERSEY

Crystal Brook Prof. Bldg.
Route 35
Eatontown
Tel: (201) 747-1060

NEW JERSEY

391 Grand Avenue
Englewood 07631
Tel: (201) 567-3933
TWX: 710-991-9707

NEW MEXICO

P.O. Box 8366
Station C 87108
6501 Lomas Boulevard N.E.
Albuquerque
Tel: (505) 255-5586
TWX: 910-989-1665

NEW MEXICO

156 Wyatt Drive
Las Cruces 88001
Tel: (505) 526-2486
TWX: 910-983-0550

NEW MEXICO

156 Wyatt Drive
Las Cruces 88001
Tel: (505) 526-2486
TWX: 910-983-0550

NEW MEXICO

156 Wyatt Drive
Las Cruces 88001
Tel: (505) 526-2486
TWX: 910-983-0550

NEW YORK

1219 Campville Road
Endicott 13760
Tel: (607) 754-0050
TWX: 510-252-0890

NEW YORK

236 East 75th Street
New York 10021
Tel: (212) 879-2023
TWX: 710-581-4376

NEW YORK

82 Washington Street
Poughkeepsie 12601
Tel: (914) 454-7330
TWX: 510-248-0012

NEW YORK

39 Saginaw Drive
Rochester 14623
Tel: (716) 473-9500
TWX: 510-253-5981

NEW YORK

1025 Northern Boulevard
Roslyn, Long Island 11576
Tel: (516) 869-8400
TWX: 510-223-0811

NEW YORK

5858 East Molloy Road
Syracuse 13211
Tel: (315) 454-2486
TWX: 710-541-0482

NORTH CAROLINA

P.O. Box 5187
1923 North Main Street
High Point 27262
Tel: (919) 882-6873
TWX: 510-926-1516

NORTH CAROLINA

P.O. Box 5187
1923 North Main Street
High Point 27262
Tel: (919) 882-6873
TWX: 510-926-1516

OHIO

5579 Pearl Road
Cleveland 44129
Tel: (216) 884-9209
TWX: 810-421-8500

OHIO

1250 West Dorothy Lane
Dayton 45409
Tel: (513) 298-0351
TWX: 810-459-1925

OREGON

2737 S.W. Corbett Avenue
Portland 97201
Tel: (503) 228-5107

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

NEW YORK

1219 Campville Road
Endicott 13760
Tel: (607) 754-0050
TWX: 510-252-0890

NEW YORK

236 East 75th Street
New York 10021
Tel: (212) 879-2023
TWX: 710-581-4376

NEW YORK

82 Washington Street
Poughkeepsie 12601
Tel: (914) 454-7330
TWX: 510-248-0012

NEW YORK

39 Saginaw Drive
Rochester 14623
Tel: (716) 473-9500
TWX: 510-253-5981

NEW YORK

1025 Northern Boulevard
Roslyn, Long Island 11576
Tel: (516) 869-8400
TWX: 510-223-0811

NEW YORK

5858 East Molloy Road
Syracuse 13211
Tel: (315) 454-2486
TWX: 710-541-0482

NORTH CAROLINA

P.O. Box 5187
1923 North Main Street
High Point 27262
Tel: (919) 882-6873
TWX: 510-926-1516

NORTH CAROLINA

P.O. Box 5187
1923 North Main Street
High Point 27262
Tel: (919) 882-6873
TWX: 510-926-1516

OHIO

5579 Pearl Road
Cleveland 44129
Tel: (216) 884-9209
TWX: 810-421-8500

OHIO

1250 West Dorothy Lane
Dayton 45409
Tel: (513) 298-0351
TWX: 810-459-1925

OREGON

2737 S.W. Corbett Avenue
Portland 97201
Tel: (503) 228-5107

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

PENNSYLVANIA

Park Place Office Building
Camp Hill
Tel: (717) 737-6791

CANADA

BRITISH COLUMBIA

Hewlett-Packard (Canada) Ltd.
2184 West Broadway
Vancouver
Tel: (604) 738-7520
TWX: 610-922-5050

ONTARIO

Hewlett-Packard (Canada) Ltd.
880 Lady Ellen Place
Ottawa 3
Tel: (613) 722-4223
TWX: 610-562-1952

QUEBEC

Hewlett-Packard (Canada) Ltd.
1415 Lawrence Avenue West
Toronto
Tel: (416) 249-9196
TWX: 610-492-2382

QUEBEC

Hewlett-Packard (Canada) Ltd.
275 Hymus Boulevard
Pointe Claire
Tel: (514) 697-4232
TWX: 610-422-3022
Telex: 01-2819

FOR AREAS NOT LISTED, CONTACT:

Hewlett-Packard Inter-Americas
1501 Page Mill Road
Palo Alto, California 94304
Tel: (415) 326-7000
TWX: 910-373-1267
Telex: 034-8461
Cable: HEWPACK Palo Alto

CENTRAL AND SOUTH AMERICA

ARGENTINA

Mauricio A. Suárez
Telecomunicaciones
Carlos Calvo 224
Buenos Aires
Tel: 30-6312, 34-9087

BRAZIL

Ciental, Importação e
Comércio Ltda.
Rua Cleto Campelo, 44 - 5º andar
Recife

BRAZIL

Ciental, Importação e
Comércio Ltda.
Avenida 13 de Maio, 13-22º andar
Rio de Janeiro, G.B.

BRAZIL

Ciental, Importação e
Comércio Ltda.
Rua Des. Eliseu Guilherme, 62
São Paulo 8
Tel: 70-2318

CHILE

Héctor Calcagni
Casilla 13942
Santiago
Tel: 490.505, 393.119

COSTA RICA

Lic. Alfredo Gallegos Gudián
Apartado 3243
San José
Tel: 21-86-13

EL SALVADOR

Electrónica
Apartado Postal 1589
San Salvador
Tel: 4683

GUATEMALA

Olander Associates Latin America
Apartado 1226
7a. Calle, 0-22, Zona 1
Guatemala City
Tel: 22812

MEXICO

Hewlett-Packard Mexicana,
S.A. de C.V.
Eugenia 408, Dept. 1
Mexico 12, D.F.

NICARAGUA

Edificio Terán G.
Apartado Postal 689
Managua
Tel: 3451, 3452

PANAMA

Electrónico Balboa, S.A.
P.O. Box 4929
Panama City
Tel: 3-0833

PERU

Fernando Ezeta B.
Av. Petit Thouars 4719
Casilla 3061
Lima
Tel: 50346

PUERTO RICO

San Juan Electronics, Inc.
Ponce de León No. 150, Stop 3
Pta. de Tierra Sta.
San Juan
Tel: (809) 725-3342

VENEZUELA

Citec, C.A.
Edif. Arisan-Of. #4
Avda. Francisco de Miranda
Apartado del Este 10934 Chacaito
Caracas
Tel: 71.88.05

FOR AREAS NOT LISTED, CONTACT:

Hewlett-Packard Inter-Americas
1501 Page Mill Road
Palo Alto, California 94304
Tel: (415) 326-7000
TWX: 910-373-1267
Telex: 034-8461
Cable: HEWPACK Palo Alto



ELECTRONIC INSTRUMENTATION SALES AND SERVICE EUROPE, AFRICA, ASIA, AUSTRALIA

EUROPE

AUSTRIA

Unilabor HmbH
Wissenschaftliche Instrumente
Rummelhardtgasse 6/3
P.O. Box 33
Vienna IX/71
Tel: 426 181

BELGIUM

Hewlett-Packard Benelux S.A.
20-24 rue de l'Hôpital
Brussels
Tel: 11 22 20

DENMARK

Tage Olsen A/S
Rønnegade 1
Copenhagen Ø
Tel: 29 48 00

FINLAND

INTO O/Y
Meritullinkatu 11
P.O. Box 10153
Helsinki 10
Tel: 61 133

FRANCE

Hewlett-Packard France
2 rue Tête d'Or
Lyon, 6 - Rhône
Tel: 52 35 66
Hewlett-Packard France
150 Boulevard Massena
Paris 13e
Tel: 707 97 19

GERMANY

Hewlett-Packard Vertriebs-GmbH
Lietzenburger Strasse 30
1 Berlin W 30
Tel: 24 86 36

Hewlett-Packard Vertriebs-GmbH
Herrenberger Strasse 110
703 Böblingen, Württemberg
Tel: 6971

Hewlett-Packard Vertriebs-GmbH
Achenbachstrasse 15
4 Düsseldorf 1
Tel: 68 52 58

Hewlett-Packard Vertriebs-GmbH
Kurfürstenstrasse 95
6 Frankfurt 50
Tel: 52 00 36

Hewlett-Packard Vertriebs-GmbH
Beim Strohhaus 26
2 Hamburg 1
Tel: 24 05 52

Hewlett-Packard Vertriebs-GmbH
Reginfriedstrasse 13
8 Munich 9
Tel: 49 51 21

GREECE

Kostos Karayannis
18, Ermou Street
Athens 126
Tel: 230 301

IRELAND

Hewlett-Packard Ltd.
224 Bath Road
Slough, Bucks, England
Tel: Slough 28406-9, 29486-9

ITALY

Hewlett-Packard Italiana S.p.A.
Viale Lunigiana 46
Milan
Tel: 69 15 84

Hewlett-Packard Italiana S.p.A.
Palazzo Italia
Piazza Marconi 25
Rome - Eur
Tel: 591 2544

NETHERLANDS

Hewlett-Packard Benelux, N.V.
de Boelelaan 1043
Amsterdam, Z.2
Tel: 42 77 77

NORWAY

Morgenstjerne & Co. A/S
Ingeniørfirma
6 Wessels Gate
Oslo
Tel: 20 16 35

PORTUGAL

Telectra
Rua Rodrigo da Fonseca 103
P.O. Box 2531
Lisbon 1
Tel: 68 60 72

SPAIN

Ataio Ingerieros
Urgel, 259
Barcelona, 11
Tel: 230-69-88
Ataio Ingenieros
Enrique Larreta 12
Madrid, 16
Tel: 235 43 44

SWEDEN

HP Instrument AB
Hagakergatan 7
Mölnådal
Tel: 031 - 27 68 00
HP Instrument AB
Centralvägen 28
Solna
Tel: 08 - 83 08 30

SWITZERLAND

HEWPAK AG
Zürcherstrasse 20
8952 Schlieren
Zurich
Tel: (051) 98 18 21

TURKEY

Telekom Engineering Bureau
P.O. Box 376 - Galata
Istanbul
Tel: 49 40 40

UNITED KINGDOM

Hewlett-Packard Ltd.
224 Bath Road
Slough, Bucks
Tel: Slough 28406-9, 29486-9

YUGOSLAVIA

Belram S.A.
83 avenue des Mimosas
Brussels 15, Belgium
Tel: 35 29 58

FOR AREAS NOT LISTED, CONTACT:

Hewlett-Packard S.A.
54 Route des Acacias
Geneva, Switzerland
Tel: (022) 42 81 50
Telex: 2.24.86
Cable: HEWPAKSA Geneva

AFRICA, ASIA, AUSTRALIA

AUSTRALIA

Sample Electronics (Vic) Pty., Ltd.
22-26 Weir Street
Glen Iris S.E. 6
Melbourne, Victoria
Tel: 20-1371 (4 lines)
Sample Electronics
(N.S.W.) Pty. Ltd.
4 Grose Street
Glebe, New South Wales
Tel: 69-6338

ETHIOPIA

African Salespower & Agency
Private Ltd., Co.
P. O. Box 718
Addis Ababa
Tel: 44090

INDIA

The Scientific Instrument Co., Ltd.
6, Tej Bahadur Sapru Road
Allahabad 1
Tel: 2451
The Scientific Instrument Co., Ltd.
240, Dr. Dadabhai Naoroji Road
Bombay 1
Tel: 26-2642

The Scientific Instr. Co., Ltd.

11, Esplanade East
Calcutta 1
Tel: 23-4129

The Scientific Instrument Co., Ltd.
30, Mount Road
Madras 2
Tel: 86339

The Scientific Instrument Co., Ltd.
B-7, Ajmeri Gate Extn.
New Delhi 1
Tel: 27-1053

IRAN

Telecom, Ltd.
P. O. Box 1812
Teheran
Tel: 43850, 48111

ISRAEL

Electronics & Engineering
Division of Motorola Israel Ltd.
16, Kremenetski Street
Tel-Aviv
Tel: 35021/2/3

JAPAN

Yokogawa-Hewlett-Packard Ltd.
Shinhankyu Building
No. 8, Umeda
Kita-ku, Osaka City
Tel: 313-0091

Yokogawa-Hewlett-Packard Ltd.
Ito Building
No. 59, Kotori-cho
Nakamura-ku, Nagoya City
Tel: 551-0215

Yokogawa-Hewlett-Packard Ltd.
Ohashi Building
No. 59, I-chome, Yoyogi
Shibuya-ku, Tokyo
Tel: 370-2281

KENYA

R. J. Tilbury Ltd.
P. O. Box 2754
Suite 517/518
Hotel Ambassador
Nairobi
Tel: 25670, 26803, 68206

KOREA

American Trading Co., Korea, Ltd.
Seoul P. O. Box 1103
112-35 Sokong-Dong
Jung-ku, Seoul
Tel: 3.7049, 3.7613

LEBANON

Constantin E. Macridis
Clemenceau Street
Clemenceau Center
Beirut
Tel: 220846

NEW ZEALAND

Sample Electronics (N.Z.) Ltd.
8 Matipo Street
Onehunga S.E. 5
Auckland
Tel: 667-356

PAKISTAN (EAST)

Mushko & Company, Ltd.
Zirat Chambers
31, Jinnah Avenue
Dacca
Tel: 80058

PAKISTAN (WEST)

Mushko & Company, Ltd.
Oosman Chambers
Victoria Road
Karachi 3
Tel: 51027, 52927

SOUTH AFRICA

F. H. Flanter & Co. (Pty.), Ltd.
Rosella House
Buitencingle Street
Cape Town
Tel: 3-3817

F. H. Flanter & Co. (Pty.), Ltd.
104 Pharmacy House
80 Jorissen Street
Braamfontein, Johannesburg
Tel: 724-4172

TAIWAN

Hwa Sheng Electronic Co., Ltd.
P. O. Box 1558
21 Nanking West Road
Taipei
Tel: 46076, 45936

THAILAND

The International
Engineering Co., Ltd.
P. O. Box 39
614 Sukhumvit Road
Bangkok
Tel: 913460-1-2

FOR AREAS NOT LISTED, CONTACT:

Hewlett-Packard Export Marketing
1501 Page Mill Road
Palo Alto, California 94304
Tel: (415) 326-7000
Telex: 034-8461
Cable: HEWPAK Palo Alto

